Macroprudential policy: What have we learned?

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Prior to the crisis of 2007–08, many central banks set up financial stability departments responsible for monitoring risks to the financial system. There was less emphasis on the appropriate responses to those risks. The experience of recent years has understandably increased the focus on policy responses, including, but not limited to, so-called 'macroprudential' policy.

This paper discusses some lessons from the recent past for policy, and to some extent, the analysis that supports it. It draws extensively from, and should be read in conjunction with, an earlier joint APRA–RBA policy document prepared ahead of the IMF FSAP mission in 2012 (APRA and RBA 2012), and some additional explication contained in two RBA speeches following that document's publication (Edey 2012, Ellis 2012*b*). It sets out an explicitly Australian, and partially personal, perspective on these issues. This perspective has been moulded by our experiences and institutional framework, in particular that Australia weathered the recent financial crisis better than most, but came quite close to having a crisis in the early 1990s.[1] As a result of these earlier experiences, by the time the global financial crisis hit, Australia had already developed an institutional framework that seems to have served us fairly well.

The paper draws out six main lessons for financial stability policy, the first of which is that policies that promote financial stability go beyond those that can reasonably be classed as 'macroprudential'. Second, this breadth of the financial stability framework stands in contrast to monetary policy regimes, in that a mapping from a single instrument to a single, numerical target is neither feasible nor sensible. Third, the specifically macroprudential part of the financial stability policy framework is an inherent part of good prudential supervision. This was the message of some of the earliest advocacy of a macroprudential perspective (e.g. Crocket 2001); separating prudential supervision into a micro and a macro function seems (to Australian eyes, at least) at odds with good practice.

Three further lessons speak to the need for a multidisciplinary or eclectic approach to this policy domain. The breadth of financial stability policy implies that its reach will always cut across multiple agencies, or multiple functions of an agency with several portfolios. Successful policy therefore requires agencies to cooperate and share information, which in turn requires the right skill sets and organisational cultures to leverage their different perspectives. In addition, the analysis to support policy requires those multiple perspectives, partly (but only partly) because the analytical models in this field are still at an early stage of development. Finally, in moving from analysis to policy, there has been an unwarranted focus on tools that lend themselves to simple numerical depiction, and not enough thought about whether the tools are directed to *causal* factors of financial instability, or merely symptoms. If this tone of scepticism seems overly cautious, it is only because the stakes are so high.

[1] See Fitz-Gibbon and Gizycki (2001).

1. Macroprudential policy is just one part of financial stability policy

Macroprudential policy is generally defined as being primarily prudential tools deployed with the aim of promoting or preserving financial stability (Borio 2003, IMF 2011*a*, 2011*b*). There are, however, many other aspects of the institutional and policy environment that affect financial stability and can be adjusted to promote it. As examples, the tax system, consumer protection regulation and market conduct requirements all shape the incentives facing financial institutions to increase leverage, ease lending standards and raise the opacity in the financial system. Supply-side factors in property markets help determine whether increases in demand translate into large price increases that might be built into expectations, or alternatively into large supply responses that can exacerbate the financial stability effects of subsequent property downturns (Ellis, Kulish and Wallace 2012).

The exchange rate regime also has an important bearing on financial stability outcomes. When the exchange rate floats freely, policymakers can set monetary policy so that interest rates are at a level appropriate to domestic circumstances. The effects of low interest rates flow through to credit and other financial variables faster than to consumer price inflation. But absent exchange rate considerations, there is no inherent reason why a sufficiently forward-looking central bank should end up setting interest rates about right for price stability, but too low for financial stability.[2] Where the exchange rate is explicitly managed, however, or where concerns about exchange rate appreciation affect the interest-setting decision, developments offshore can distort monetary policy, especially for small open economies. If trading partners are growing more slowly than the domestic economy, exchange rate considerations may induce the monetary policy maker to set interest rates lower than purely domestic conditions would imply. Excessive risk-taking and credit growth are more likely to occur in these circumstances; this is just a normal part of the transmission mechanism of monetary policy, though not always a welcome one.

Macroprudential policy is therefore only a part of the suite of policies available to governments to promote financial stability, either directly or via the regulators to which they delegate some powers. For this reason, in Australia we view macroprudential policy as being subsumed within the broader financial stability policy framework, a view shared by at least some other authorities in the Asia-Pacific region (see Khemangkorn 2011 for a view from Thailand). More generally, the overall institutional framework and policy context matters greatly for financial stability outcomes. While it may seem like a semantic concern, redefining monetary policy or capital controls as 'macroprudential' appears to confuse the classification of a policy tool with the motivation for its use.

[2] I am not aware of any model with the property that the neutral real interest rate for the real economy is lower than the 'neutral' rate needed to avoid damaging financial speculation. Much of the concern about low interest rates seems to relate to countries that did not have control over their own monetary policy because they were in a currency union or they had a fixed or managed exchange rate regime. Estimates of deviations of actual policy rates from Taylor rules are generally within the normal bounds of model forecast errors, for example as captured in Bank of England fan charts.

The experience of recent years suggests at least one rather comforting ancillary lesson. The policy areas less obviously connected to financial stability, such as consumer protection regulation, do not have to be perfect to contribute to preserving stability. There is of course always room to refine and improve these policies in light of experience, including that of other countries. For example, in Australia, the previously state-based but uniform consumer credit code was reformed and brought under national control in 2009. The range of products covered was broadened, and the suitability tests that lenders must apply were tightened. However, this reform was not motivated by financial stability considerations, and the previous system already had the features needed to avoid a systemic deterioration of lending standards beyond the point of prudence.

Among the key features needed in the consumer protection regime are that it should be nationally consistent; it should cover all consumer borrowers; and it should cover all lenders, including those that are not prudentially supervised. Furthermore, it should ensure that lenders only lend up to the amount that borrowers can be reasonably expected to repay from their own resources, without selling the collateral if it is their own home. In the Australian system, a loan can be modified or set aside by the courts if this suitability test is not met. It would not be permissible under these arrangements to make loans that would only pay if the borrower could later refinance after housing prices rose. Such loans would generally end up having to be forgiven or modified if the borrowers defaulted. The knowledge that loans of this kind would almost certainly be set aside if they defaulted deters lenders from making them. This would have ruled out many of the loans (or sizes of loans) made during the US mortgage boom.

2. Financial stability policy is not like monetary policy

Most modern analysis of monetary policy and appropriate monetary policy regimes follows the instrument–target framework first proposed by Tinbergen (1952).[3] There is an instrument – nowadays usually interest rates – that is manipulated by the policymaker to hit a single numerical target, which is specified either as an inflation target or a social welfare function that explicitly penalises both inflation and inflation variability.

Financial stability policy does not easily fit into this mould. There are many instruments, even within the class of macroprudential tools. And many of the variables that have been promoted as decision variables – for example particular asset price levels or trends, or particular relationships between credit and GDP – do not have a clear relationship to social welfare. They would be more appropriately thought of as intermediate targets, much like the monetary targets that were tried (and that failed) in the 1970s and 1980s.

In this regard, financial stability policy is no different from almost every realm of public policy other than monetary policy. The implementations of health, education, defence or public safety policies are often managed according to a suite of numerical targets or KPIs. Yet in no sense is, say, health policy conceived of as an attempt to hit a particular target using a particular instrument. Only monetary policy is described in this way, and there does not appear to be any good reason to shoehorn other policy domains into the same analytical framework.

[3] See, for example, Woodford (2003).

Financial stability policy also differs from monetary policy in that the target is not observable and not completely controllable at the national level, which makes accountabilities rather unclear. Financial stability is not assured simply because at present there is no crisis. Stability should also imply that the risk of a crisis be kept low. Yet a risk of a future event is inherently hard to observe and any estimate of that risk is at best hypothetical. In addition, short of costly financial autarky, there is no way to insulate a jurisdiction fully from the actions (or more often, inactions) of other jurisdictions. By contrast, a floating exchange rate regime does allow a country to be fully in control – and thus fully responsible – for its medium-term inflation outcomes.[4]

If financial stability is hard to define, it might be thought that at least we know financial *instability* when we see it (albeit too late to do much more than crisis management). But even here, it is hard to define a mandate as clear-cut as an inflation target can be. If we are going to define a financial crisis as a failure of financial stability policy, then it matters how we define a crisis. If one or a few small financial institutions were to fail, even prudentially regulated ones, should this be considered a crisis, and thus that the responsible policymakers have failed to meet their financial stability mandate? If the 'zero failures' test is to be our metric of success, the financial sector will end up with no market or other discipline at all. The alternative working definition of financial instability – where the financial sector is impinging on real economic output – is conceptually clear-cut but likewise not directly measurable in the way that a consumer price index can be.

3. A macro perspective is needed for competent prudential supervision

Particularly since the crisis, a perception has arisen that separate macroprudential decision processes – or even separate policymakers – are needed as complements to the 'microprudential' supervisor focussed on individual institutions (e.g. IMF 2011*b*). In the view of the Australian authorities, while the diagnosis of the problems of excessively micro-oriented regulation is broadly correct, the proposed solution does not follow, and might even be counterproductive.

As noted by Edey (2012), the distinction between micro and macro supervision corresponds to the distinction between idiosyncratic risk and portfolio risk: Crockett (2000) referred to the latter as 'systemic risk'. Indeed the analogy to portfolio risk has motivated a number of studies using measures of financial risk in investment portfolios to measure the systemic risk posed by particular institutions (e.g. Huang, Zhou and Zhu 2010). Within this conceptualisation of systemic risk, much of the discussion has quite properly distinguished between contributions to risk at a point in time, and the build-up of risk over time.

The key question, though, when designing institutional arrangements for financial stability policy, is whether these different aspects of risks to financial stability should be mandated to different agencies. The Australian view is that these risks cannot be separated so easily in practice as the

[4] There is a limit to the feasible accountability of policymakers for *short-term* price stability, however. All economies are subject to supply-side shocks that flow through to consumer prices faster than monetary policy can offset them. For a good Australian example of this, see the discussion on bananas in RBA (2011). Beyond this, Australia's inflation targeting framework of 2 to 3 per cent over the life of the cycle allows policymakers more flexibility to address building financial stability risks that could jeopardise the medium-term inflation outlook, through either inflation or deflation (Stevens 2003).

recent literature often implies. Part of the reason for this is an identification problem – is systemic risk building, or it is just that one or two large firms happen to be behaving in an unsound way? In this respect it is worth noting that many countries, including Australia, have relatively concentrated banking industries. The distinction between macro and micro is particularly blurred when half a dozen firms account for 70–80 per cent of the system.

Similarly, it is difficult to establish if a build-up in risk merits a 'macroprudential' response, or whether it is a sign that the overall prudential framework was not calibrated tightly enough to begin with. Flaws in the (micro)prudential regulatory framework will still manifest most during financial booms and in the firms that pose the most systemic risk, and therefore might be hard to distinguish from macroprudential concerns.

A more fundamental reason for our view is that even a supervisor with a narrow mandate to preserve the soundness of individual institutions would recognise that the most common cause of failures historically has been systemic crises. Thus caring about the micro-dimension *requires* one to care about the macro-dimension as well. At the same time, systemic risks usually build up because individual firms engage in practices that would not be considered prudentially sound even in isolation. The prudential responses to that macro-risk will therefore fall most heavily on the individual institutions contributing to it. Feedbacks and spill-over effects certainly can exacerbate risks, and a fully micro-level view would not automatically allow for them. Even so, recent episodes of financial distress can generally be traced back to extreme individual risk-taking via unusually lax lending standards and short-dated funding profiles. Put another way, good (micro)prudential supervision might not be a sufficient condition to ensure macro-stability, but it is surely a necessary condition!

There are cases where the micro-perspective and macro-perspective seem to conflict, for example when micro-considerations would demand that a firm pull back on lending or sell assets, but that is not what the overall economy needs. In practice, though, competent prudential supervisors are more than capable of internalising this issue in their supervisory activities. Admittedly this is more difficult when there is more than one prudential supervisor in the relevant jurisdiction. It is also more difficult when the policy framework is cast as primarily regulatory and rules-based, rather than a supervisory approach with some room for forward-looking judgement and supervisory direction. Yet the experience in Australia, at least, shows that the 'marriage' of the micro and macro perspectives advocated by Crockett (2001) can be made to work reasonably effectively.

As discussed in the joint APRA–RBA paper (APRA and RBA 2012), there are a number of supervisory tools and processes that APRA uses to identify and respond to risks at the industry or system level. These include an industry-wide risk management framework, in which macro-level and industry-level risks are identified and, if deemed sufficiently important for a large enough fraction of the industry, recorded in industry risk registers. A risk owner is appointed to manage each of these risks. Responses to those risks are cascaded to the Supervisory Action Plans for individual institutions, which are in turn calibrated to the systemic impact of the each institution according to APRA's Probability and Impact Rating System (PAIRS, see APRA 2012).

The alternative approach, of separating the use of the same prudential tools across two bodies according to the goal, could be counterproductive for a variety of reasons. The most obvious of these is the issue of policy coordination, already well-known from the literature on coordination of monetary and fiscal policies. In many respects, it would be more likely that the two agencies would double-up than actively offset each other's actions. For example, it would be quite possible for a 'micro' regulator to set Pillar 2 capital add-ons to firms for the same reasons that motivate the setting of capital surcharges on systemic institutions. Leaning against a credit boom could be achieved either with an industry-wide capital buffer or binding supervisory directions to desist from certain practices. Provisioning levels can be set in supervisory action plans or according to an industry-wide rule with essentially the same effect. A macro-regulator might find that the many small actions of the micro-regulator have pre-empted its decision. On the other hand, if the decisions of the macro-regulator were not credible to the micro-regulator, it could use its prudential tools to offset them.

Of course, if the prudential supervisor is to act in response to financial stability (macro) concerns, it must be willing and empowered to recalibrate the prudential settings in its jurisdiction to be more conservative than internationally agreed minima. A separate macroprudential decision maker might be a second-best response in jurisdictions where prudential supervision is itself not coordinated across the whole system, or where political or organisational cultural constraints prevent the prudential regulator from taking a sufficiently macro perspective on its own. But it is not clear that the separation is needed if these constraints are absent. As always, institutional arrangements cannot be treated as a 'one size fits all' solution across every country.

If the prudential supervisor is being overly 'micro' in orientation, that can be fixed. If the issue is that the mandate of the supervisor is narrowly focused on individual institutions, then that is a political choice that can be changed. In Australia, for example, the prudential supervisor has as part of its legislative mandate to promote financial stability, while the central bank does not have such an explicit legislative mandate.[5] Creating a new institution might be a practical response to the failings of an existing one, but it should not be assumed to be the only option.

Of course, turning an overly micro-focused regulator into a macro-oriented supervisor is easier said than done. A new mandate requires a political consensus in support of the shift to a more systemic view; compared with actions motivated by more microprudential concerns, supervision from a holistic or systemic perspective will seem more pre-emptive. It will therefore be more likely to be opposed as unnecessary by the entities subjected to it. New modes of analysis must be developed and integrated into the supervisory process. This may in turn require officials to change

[5] The RBA's responsibility for systemic financial stability is, however, part of the legislative framework. In the Australian legal system, a court would rely on the explanatory notes and Second Reading Speech in Parliament when interpreting legislation. In 1998, the then Treasurer explicitly referred to financial stability being the regulatory focus for the RBA, in the Second Reading Speech in support of the APRA Act (see http://fsi.treasury.gov.au/content/downloads/PublicInfo/Speeches/FSI_SecondReadingSpeeches.rtf). More recently, in 2010 the RBA and the Government recorded their common understanding of the RBA's longstanding responsibility for financial system stability, as part of the periodically updated Statement on the Conduct of Monetary Policy (see http://www.rba.gov.au/monetary-policy/framework/stmt-conduct-mp-5-30092010.html).

their modes of thinking, and might even require some change in personnel. And as noted above, it might also require a prudential framework that puts more emphasis on supervision rather than being narrowly focused on compliance with prudential regulations.

4. Inter-organisational relationships and organisational culture matter

Because the influences on financial stability and the range of possible policy responses are both so broad, financial stability policy inevitably involves more than one agency. Inter-agency relationships and cooperation turn out to be crucial to effective action, especially during crises. Even in jurisdictions where prudential supervision and financial stability analysis are in the same agency, the same need applies, especially if the two functions are on separate reporting lines. And where 'macroprudential' policy tools are decided on and implemented by a different agency than the actual prudential supervisor, close coordination is essential to avoid operating at cross-purposes, or alternatively 'doubling up' on policy action, as discussed in the previous section.

One effective means for coordinating policy advice and action is through a council structure. In Australia, for example, the Council of Financial Regulators brings together the prudential supervisor, the securities regulator and the Treasury, along with the central bank as chair of the group.[6] Several other countries have also had comprehensive councils of this kind for some years – as opposed to bodies that coordinate multiple prudential supervisors – while other jurisdictions have set them up more recently in response to the crisis.

Councils can serve as the primary venue for apprising all the relevant agencies about matters of mutual interest, including but not limited to current risks to financial stability. It is not necessary for a council to have its own formal powers or decision-making authority. It can instead be a forum for discussing decisions in one agency's remit that might impinge on the mandate of another, such as a prudential decision that affects disclosure regimes regulated by the securities regulator.[7] In its role as an adviser to government, it can make recommendations that go beyond any individual agency's current mandate; this is especially useful if the regulatory perimeter needs to be adjusted through legislation.

Prudential supervisors and central bank financial stability functions also need to cooperate bilaterally because each agency brings different things to the authorities' analysis of risks and their response to financial distress. In particular, each has access to information that the other would not normally have access to, including qualitative supervisory observations on the one hand, and information from central bank market operations on the other. The two institutions also have different sensibilities and look at data in different ways. These different perspectives can help avoid 'group-think', including the kind that arises when key staff are all educated in the same discipline, namely (macro)economics. In particular, where prudential supervision of banking and insurance is consolidated in a single supervisor, the supervisor's perspective takes on elements of actuarial science that might not always exist in a pure banking supervisor. The actuarial approach

[6] For more information about the Council, see http://www.cfr.gov.au/.

[7] In Australia, APRA's directions powers over institutions it supervises override the disclosure requirements for listed companies, so it can legally direct an institution not to disclose certain matters.

to risk is a helpful counterpoint to the finance/economics approach that dominates in central banks. It is also arguably better suited to analysis of the tail events and correlations that are crucial in financial stability analysis; the debate over the relative merits of expected loss (and the Extreme Value Theory it is based on) versus Value-at-Risk is a case in point (BCBS 2012).

Even where supervision is in the central bank/monetary authority, the same issues of cooperation and coordination apply. Additional issues may also arise, including the manageability of an organisation with such diverse responsibilities, and the potential for rivalry amongst senior executives of different divisions for the positions at the top. Different countries may find that different arrangements work better for them. In our experience, though, there is considerable advantage to having an agency where prudential supervision is its first priority, even in the good times. In fact, it is especially during the good times that a single-minded focus on prudential supervision is most needed, because that is the period when risks begin to build up (Byres 2009).

In Australia, the interagency relationships are supported by a range of formal structures. These include Memoranda of Understanding both bilaterally between APRA and the RBA, and multilaterally across all four Council agencies. There are also formal meetings of a co-ordination committee of senior officials from APRA and RBA which meets roughly every six weeks, as well as working groups of staff from all Council agencies for particular ongoing shared work. Beyond these formal structures, there are a range of informal structures and practices that help maintain the interagency relationships. Among these are regular secondments of staff, forums for analysts from both APRA and the RBA to present their work to each other, and regular presentations by senior staff to staff from other agencies.

Effective cooperation in countries like Australia does not require that key officials in the supervisory authority be former central bankers. It is, however, essential that staff in both agencies recognise that they have a professional duty to cooperate. Organisational cultures must embed a clear understanding that the shared goals of financial stability and good public policy generally are more important than the status of particular agencies. Ideally, this element of organisational culture should be supported with explicit accountabilities for relationship building, for example in KPIs, position objectives or other formal accountabilities.

The most obvious area where cooperative organisational cultures come into play is in the sharing of information. As well as sharing their risk assessments candidly, agencies need to share data on financial institutions: data protection regimes need to be designed accordingly. In Australia, APRA has legislative responsibility to collect data from financial institutions, even where the data are needed by the RBA or another agency to meet statistical needs or support the goals of monetary policy or other financial policies.[8] By centralising the data collection, respondent burden can be minimised, thereby allowing a more expansive collection overall than might otherwise have been possible. Once collected, the data are sent to the RBA at least daily, via a dedicated feed. There is a

[8] The relevant law is the *Financial Sector (Collection of Data) Act 2001*. The object of the Act is to enable APRA 'to collect information in order to assist: (a) APRA in the prudential regulation or monitoring of bodies in the financial sector; and (b) another financial sector agency to perform its functions or exercise its powers; and (c) the Minister to formulate financial policy.' (See http://www.comlaw.gov.au/Details/C2011C00325.)

longstanding cost-sharing agreement supporting this process; the RBA also devotes considerable resources to quality assurance on the data, which assists APRA's statistical division in improving the collection. A tripartite steering committee comprising APRA, the RBA and the Australian Bureau of Statistics, governs the inter-agency aspects of this statistical function.

As part of the data-sharing arrangements, the RBA may have access to prudential data on individual institutions, subject to appropriate confidentiality arrangements, graduated according to the sensitivity of the data. This applies to all prudential statistical returns, including market-sensitive data, for banking and insurance, as well as bank prudential capital (Pillar 2) ratios.

This data-sharing arrangement has several advantages, despite the considerable efforts involved in maintaining the relationship and data quality across prudential and non-prudential data. Firstly, APRA and the RBA can then make risk assessments based on consistent information. Secondly, both the public and financial sectors save resources by only having a single infrastructure for data collection. Thirdly, in our experience the diversity of educational backgrounds brings advantages to the quality assurance process. Central bank economists look at data differently from the statisticians and supervisors at the prudential regulator. This has on occasion allowed the RBA to pick up issues with reporting at particular institutions. (Aside from both agencies' need for accurate data, if a bank fails to report even non-prudential data properly, that is a useful signal about its operational risk environment.)

The right organisational culture goes beyond a willingness to collaborate on common goals and share information. A number of industrialised countries experienced banking crises in the early 1990s, including Japan and several Nordic countries, while Australia went through an episode of recession and financial distress that approached crisis conditions but did not see any major bank failures.[9] Similarly, several countries in east Asia went through crises in the late 1990s. It is not surprising that these countries were largely untouched by the financial repercussions of the more recent crisis of 2007–08, even if they went into recession. There seems to be some sort of corporate memory, both in banks and at regulators, that makes decision-makers warier of risk in the aftermath of such a crisis. The question is how to maintain that more prudent culture as the cohort of staff that had been directly involved move on. This is something we intend to consider more explicitly in coming years.

Whether the objectives are microprudential, macroprudential, or some combination of the two, all the tools and powers will not compensate for an ineffective organisational culture at the relevant agencies. The aspect of organisational culture that seems most corrosive to effective prudential supervision is a belief that the banks have an inherent advantage over the regulators. While the bankers might be paid more, the supervisors have the law – and ideally a belief in their mission – on their side. Yet there have been instances in some countries where a belief that banks will always subvert their attempts to ensure prudent behaviour has discouraged supervisors from even trying.

[9] Some state-owned banks did become distressed in the early 1990s and had to be acquired. In addition, an Australian insurance company, HIH, failed in 2001. Even though it was an idiosyncratic failure with no contagion to the rest of the financial system, this episode also taught us some important lessons that were subsequently incorporated into the regulatory architecture in Australia.

Supervisors also need the political backing to do their jobs in the face of opposition from regulated entities. It is useful for a non-regulatory central bank to help provide that backing. In particular, speeches and other communication by central banks tend to receive more attention than those of independent prudential supervisors, at least in the Australian experience. Public backing by the central bank of supervisory actions can therefore be a useful part of a cooperative relationship and enhance the effectiveness of supervision. As noted in the APRA–RBA paper (APRA and RBA 2012), the RBA does use its own communication in support of APRA's decisions and to place those actions in the context of the overall financial stability policy framework.

5. The approach to analysis must be eclectic

The financial crisis has provoked much soul-searching in academia as well as in the policy community. A number of authors have criticised the current generation of canonical macroeconomic models – especially those in the DSGE tradition – or particular assumptions that they are thought to rest upon, such as rational expectations (e.g. Kirman 2009 and Coyle 2011). Ironically, much of the academic response to this critique seems to have been to try to graft financial sectors onto existing DSGE models.

To be fair, the kinds of models that lend themselves to analysis of monetary policy questions were always going to be unsuited to analysis of questions in financial stability risk monitoring and policy. This is not just because they lack financial sectors or clear balance-sheet relationships. Perhaps more importantly, these models lack sectoral and distributional elements that are essential for detecting emerging distress. A purely aggregate model will never pick up emerging financial distress affecting banks' loan books, for example, because it is never the median or average-risk borrower that defaults, and the bank is insolvent long before default rates rise to 50 per cent.

It could be argued that the mechanisms of speculative boom–bust cycles had been well understood since at least Kindleberger (1978) and policymakers therefore should have recognised the dangers building up even if their models were not perfect. Nonetheless the new lessons from the recent crisis, and the renewed mandates for (or at least emphasis on) financial stability policy, call for new and improved models for analysis. The Australian authorities' take on this is that models, plural, are needed, and that building a single, does-it-all model will not be that helpful, even if it were feasible.

At least some of the models need not be so new. There are a number of strands of existing literature that have proven quite useful in analysing financial stability issues.[10] The most obvious of these is the tradition of careful balance-sheet analysis, taking account of stock–flow consistency, which is associated with the work of Wynne Godley. This analytical tradition is the intellectual precursor of much of the sorts of discussion that fills financial stability reviews and motivates the IMF's Financial Soundness Indicator standard. It emphasises sectoral balance sheets, and lends itself to an assessment of the *resilience* of each sector, including the non-financial sectors, more so than the risks they are taking.

[10] See Arnold et al (2012) and Galbraith (2009) for some further discussion on these potentially useful strands of literature.

The historicism of Kindleberger also provides a starting point for an understanding of financial boom–bust dynamics, if not the incentives facing banks and the regulatory mechanisms that shape those incentives. Despite some recent attempts to construct a model based on Kindleberger–Minsky type mechanisms, there is as yet no accepted model in this tradition.

Another existing literature (or family of literatures) that has proven useful in focused analysis of specific policy questions deals with asymmetric information, contract design, and the scope and incentives for fraud or self-dealing. Issues of governance loom large in this area, a common theme in some of the corporate finance literature. Asymmetric information is a key feature of much of the literature on crises, bank runs and credit default risk, which is too extensive to survey here.

One potentially fruitful strand of models might come from the wide-ranging literature that recognises that agents are intelligent and purposeful, but don't know the full workings of the economic system. Agent-based modelling, in particular, steps away from the unrealism of the rational expectations/full information paradigm without making arbitrary assumptions of irrationality (see Tesfatsion 2006 for a survey). The recent interest in network analysis of financial stability issues can be seen as a subset of this broader class of models.

More generally though, the Australian authorities have found it useful to focus on the *behaviours* of actors within the financial system, even if these behaviours do not lend themselves to accurate quantification or inclusion in a model that meets academic standards. Two behaviours that deserve particular attention are risk-taking and rent-seeking. This view can be seen as melding the Kindleberger–Minsky perspective on the one hand, and the asymmetric information / governance perspective on the other. Market pricing and turnover are particularly useful indicators of risk appetite, while developments in the market for corporate control provide useful signals about both risk-taking and potential rent-seeking. Market intelligence, direct liaison with firms or supervisory reviews of their functions, and analysis of buy-side activity are all useful sources of information about these behaviours. Other examples include the terms and conditions in contracts and products, and whether an unusually large number of new financial products are being introduced. Compensation practices can also be used as an indicator of the potential for rent-seeking, as well as an area amenable to (macro)prudential policy responses.

6. Scepticism is warranted about many proposed macroprudential tools

Following the crisis, there has been a flurry of work inventing and refining macroprudential tools that are intended to reduce risks to financial stability (e.g. CGFS 2010, Lim *et al* 2011). Likewise there have been numerous proposed measures of the unobservable quantity, 'systemic risk' (see Bisias *et al* 2012 for a survey).

Many of these tools are directed at quantities and measures that have build-up phases that correspond to the few years before a crisis occurs (Borio and Lowe 2001, Borio and Drehmann 2009). However, there has been relatively little analysis of the causal mechanisms behind the identified correlations. Hence we do not yet know if, in seeking to control these particular measures of quantities, we are treating the symptoms and not the causes of future financial distress.

This uncertainty is particularly relevant when considering risks from the housing market. There is no disputing that housing prices tend to rise rapidly during credit booms. However, a dispassionate analysis of recent banking crises shows that – aside from the recent US episode – the source of the banks' distress is not usually the mortgage book. It is possible to get into trouble in mortgage lending to households, so risks from this market must be given at least some weight. The experience of Ireland, Spain, the United Kingdom and elsewhere recently – as well as Australia, Japan and the Nordic countries in the early 1990s – nonetheless shows that property development loans are a more likely source of loan losses. Loan losses on mortgages tend to track unemployment, and hence tend to be a *consequence* more than a cause of banking crises.

More often than not, the element of the financial boom–bust cycle that produces financial sector distress is quite unrelated to housing. The literature might simply be picking up the fact that housing prices and commercial property prices are correlated in these episodes, for example; housing prices get all the focus because the data are easier to compile and generally more readily available.[11] Even if risks are building in the residential development loan portfolio, where funding models and project life are more akin to commercial property exposures and risks are therefore genuinely higher as these have characteristics more akin to pure commercial property development, limiting households' capacity to pay for housing only indirectly constrains this dynamic.

When risks do arise, the policy tools used in response should be chosen for their efficacy in limiting the probability or extent of financial instability, and not simply because they are analytically convenient or easy to observe. The Australian authorities have some specific concerns about caps on loan-to-valuation ratios, which have been canvassed elsewhere (e.g. Ellis 2012*a*). But more generally, it is our observation that many of the tools that are being proposed are overly focused on dimensions of lending standards that can be framed as simple numerical metrics.

Another concern is that many of the suggested tools do not conform to good practices of credit risk management across a whole portfolio. The specific dimensions of lending standards that have attracted controls are not necessarily well aligned to the way experts think about credit risk. For example, a uniform ceiling on debt-servicing ratios ignores that different borrowers may have different servicing capacities out of the same income because their other obligations and circumstances differ. A simple example for the case of a mortgage loan would be where borrowers already had other debts, or different family sizes. Competent lenders take account of these differences in their procedures for assessing creditworthiness, and determining the amounts they will lend, but macroprudential tools as currently proposed and implemented do not. An alternative to consider might be a directive to add a buffer to the interest rate used to calculate

[11] Commercial real estate price indices are more difficult to compile than indices for residential real estate prices because there are fewer such properties and they are more heterogeneous than dwellings, encompassing office, retail and industrial property as well as specialist property such as nursing homes. Each subtype essentially behaves as a separate market, so transacted prices are particularly lumpy. By contrast, demand for housing is sufficiently fungible across houses and apartments that one can reasonably expect arbitrage between the two housing types and derive price indices for dwellings in aggregate as well as each type separately.

repayments when qualifying borrowers for loans. Applying a buffer is already common practice amongst mortgage lenders in countries such as Australia, where variable-rate loans predominate, and could be easily be subject to supervisory guidance or regulation if necessary.

Finally, there has to date been too little independent evaluation of the effectiveness of these policies. International policy mandates from the G-20 and elsewhere might have encouraged a tendency to judge favourably the evidence on particular tools and indeed of a tools-based framework altogether. There has been something of an attitude of, 'We must do something! This is something; therefore we must do it.' It has not been sufficiently recognised that differing national circumstances and institutions might shape the desirable features of a financial stability policy regime, and the need for these kinds of tools within that broader regime. For example, under some exchange rate regimes, macroprudential policy might need to be relied upon as a substitute for setting monetary policy entirely with regard to domestic circumstances, but this might not be a relevant consideration for other countries. It also remains to be seen if this macroprudential approach to solving the 'trilemma' (fixed exchange rates, open capital markets and monetary – or in this case financial – stability) can succeed.

Many of the most influential papers on macroprudential policy have never been subjected to peer review. Thus while some papers present econometric evidence claiming to show the efficacy of some macroprudential tools on some other variables, it is difficult to tell if this evidence is robust to different country samples, time periods or definitions of success. In particular, just as with monetary targeting before it, evidence that macroprudential tools affect variables such as credit (e.g. Lim *et al* 2011) need not imply a positive effect on financial stability and social welfare; the policy intervention might simply be altering the relationship between the intermediate variable and the ultimate goals. The fact that none of these papers have found that a particular tool has *not* worked well might just be the usual bias against publication of negative results. However it seems puzzling in light of some countries' experience, of introducing multiple rounds of macroprudential measures after the previous rounds have not had the desired effect.

7. Conclusion

The lessons of the crisis have not been, in our view, that we should rush into deploying numerical 'macroprudential' tools, or that countries necessarily need a macroprudential policy function separate from the supposedly microprudential regulator. But the experience has vindicated the general approach of broadening the mandate of prudential supervision away from a narrow focus on the solvency of individual institutions, if that is the way the mandate is currently specified. This was the original message of the early advocates of the macroprudential perspective, and it is our observation that some of the more recent discussion has lost sight of that understanding. In our view, macroprudential policy is more of a state of mind than a suite of tools. More generally, it is our observation that the experience of recent years has vindicated an approach to prudential policy that puts more emphasis on supervision, rather than being narrowly focussed on 'tick-a-box' regulation and compliance.

The Australian authorities therefore do not propose to introduce a set of tools as a separate macroprudential regime any time soon. Although APRA has included the countercyclical capital buffer in its implementation of Basel III, and will consult with the RBA in developing the supporting analysis, it will not follow a rule-based approach to the use of the buffer (see Box C in APRA and RBA 2012).

The financial stability policy debate is ongoing, and there is no doubt that the policymaking community will learn more about best practice analytics and policy in coming years. In the meantime, it seems essential that countries adopt policy frameworks best suited to their national circumstances, rather than prematurely harmonising on some untested proposals. If particular tools turn out to be counterproductive, or just not suited to certain kinds of institutional arrangements, it would be best if the mistake is not a global one.

Disclaimer: Views expressed in this paper are those of the author and not necessarily those of the Reserve Bank. Any reference to this paper should clearly attribute the work to the author and not to the Reserve Bank of Australia.

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Macroprudential policy: What have we learned?

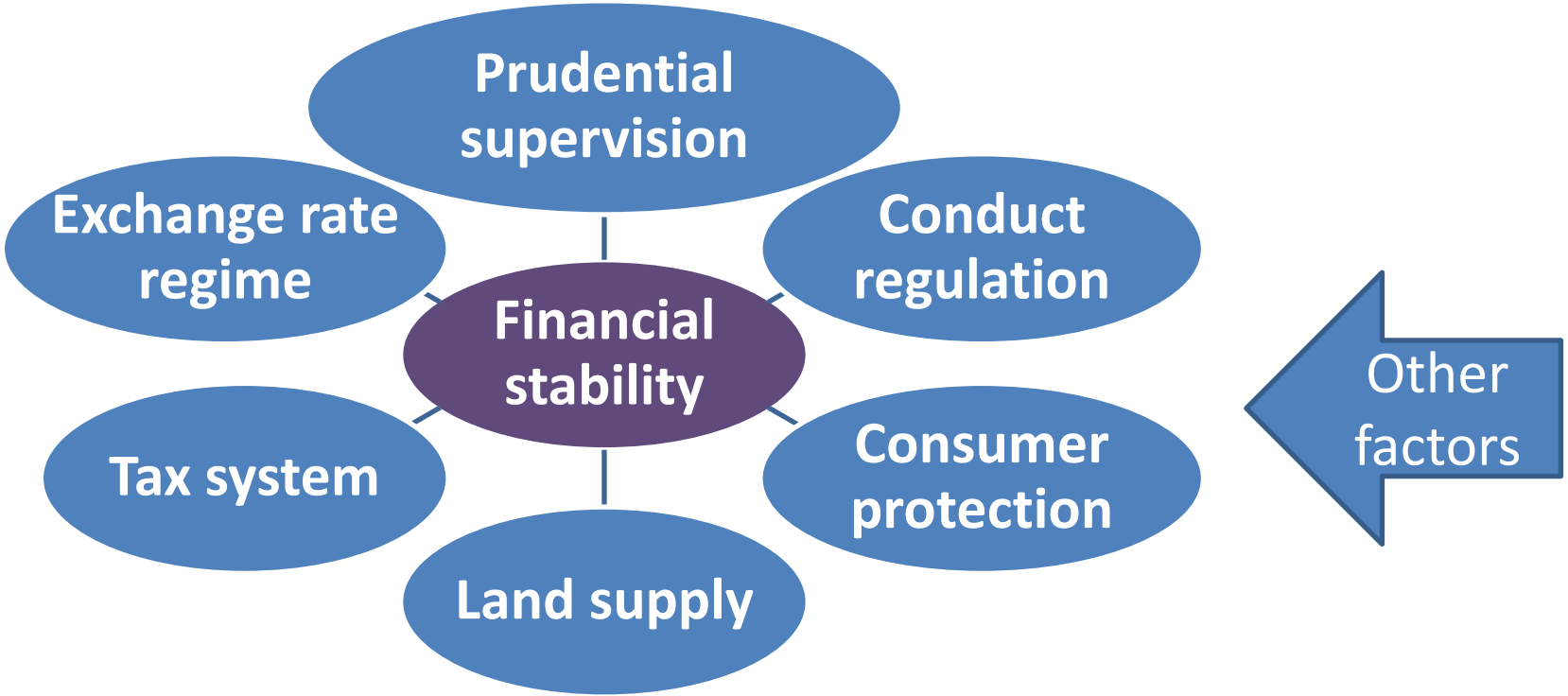
Luci Ellis
Head of Financial Stability
Reserve Bank of Australia

Presentation to Bank of England Roundtable for Heads of Financial Stability

What this talk is

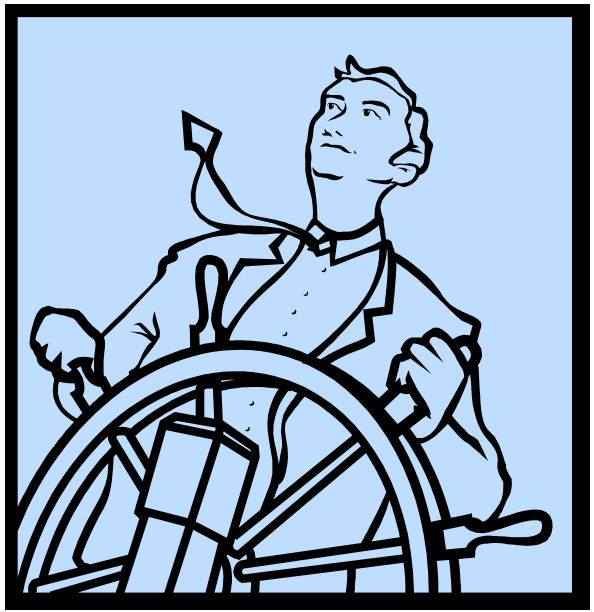
- A distinctively Australian perspective
- A little sceptical of the growing consensus about macroprudential policy
- Designed to get you thinking
- Not suggesting that I have (or Australia has) all the answers!

Lesson 1: Macroprudential policy is subsumed in the broader financial stability policy framework



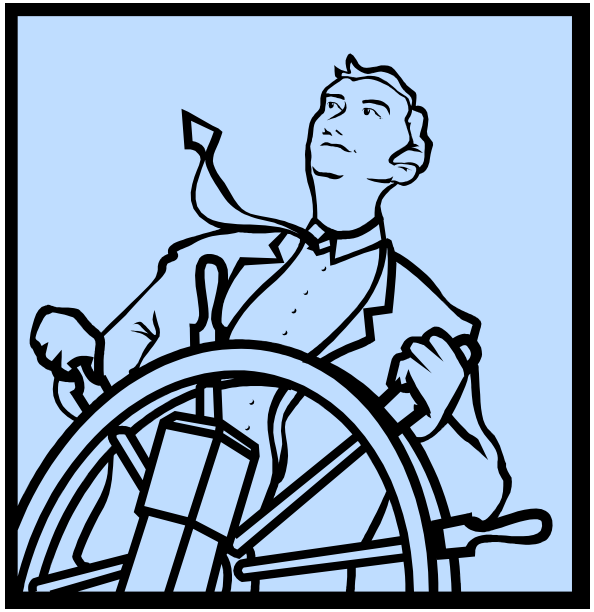
Lesson 2: Financial stability policy is not like monetary policy

Monetary policy



Lesson 2: Financial stability policy is not like monetary policy

Monetary policy



Financial stability policy

Picture credit: Shutterstock.com

Lesson 2: Financial stability policy is not like monetary policy

Policy	Instrument	Objective
Monetary policy	Interest rates (usually)	Inflation target (or SWF with inflation variability)

Lesson 2: Financial stability policy is not like monetary policy

Policy	Instrument	Objective
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Health policy	?	?

Lesson 2: Financial stability policy is not like monetary policy

Policy	Instrument	Objective
Monetary policy	Interest rates (usually)	Inflation target (or SWF with inflation variability)
Health policy	?	?
Education policy	?	?

Lesson 2: Financial stability policy is not like monetary policy

Policy	Instrument	Objective
Monetary policy	Interest rates (usually)	Inflation target (or SWF with inflation variability)
Health policy	?	?
Education policy	?	?
Defence policy	?	?

Lesson 2: Financial stability policy is not like monetary policy

Policy	Instrument	Objective
Monetary policy	Interest rates (usually)	Inflation target (or SWF with inflation variability)
Health policy	?	?
Education policy	?	?
Defence policy	?	?
Financial stability policy	?	?

Lesson 3: A macro-perspective is needed for *competent* prudential supervision anyway

Not competent

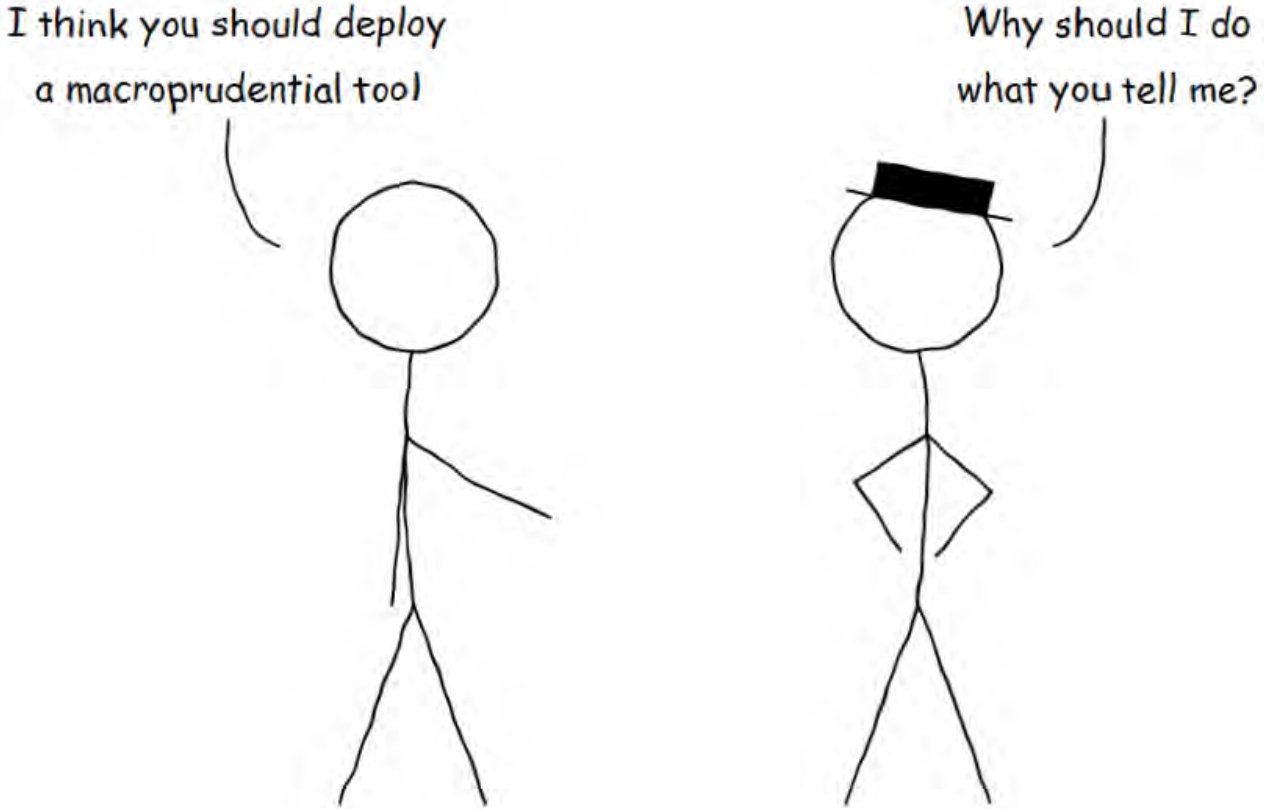
Image: RetroClipArt/Shutterstock.com

Lesson 3: A macro-perspective is needed for *competent* prudential supervision anyway

Better

Image: RetroClipArt/Shutterstock.com

Lesson 4: Inter-organisational relationships and culture matter



Source: RBA; mathematica.stackexchange.com; apologies to Randall Munroe

Lesson 4: Inter-organisational relationships and culture matter

- **From Luci's job description…**

KEY POSITION OBJECTIVES

- Preparation of policy advice, research material and other information relevant to the Governor's role as chairperson of the Council of Financial Regulators and as a member of the Financial Stability Forum.
- Preparation of the Bank's semi-annual Financial Stability Review.
- Maintenance of relations with senior executives of the Australian Prudential Regulation Authority and other central banks.
- Ensuring that the Bank's interests are appropriately represented in relevant forums both domestically and internationally.
- Leadership and oversight of Financial Stability Department to ensure its staffing, professional training, skills and morale are maintained at a level which efficiently achieves the Bank's objectives.

Lesson 4 (cont'd): Caring and sharing

- Data
- Information
- Analytical results
- Staff (secondments)
- Supportive communication

Lesson 4 (cont'd):
Believe in your mission!

"Whether you think you can, or you think you can't – you're right!"

– Henry Ford

Lesson 5: The approach to analysis must be eclectic

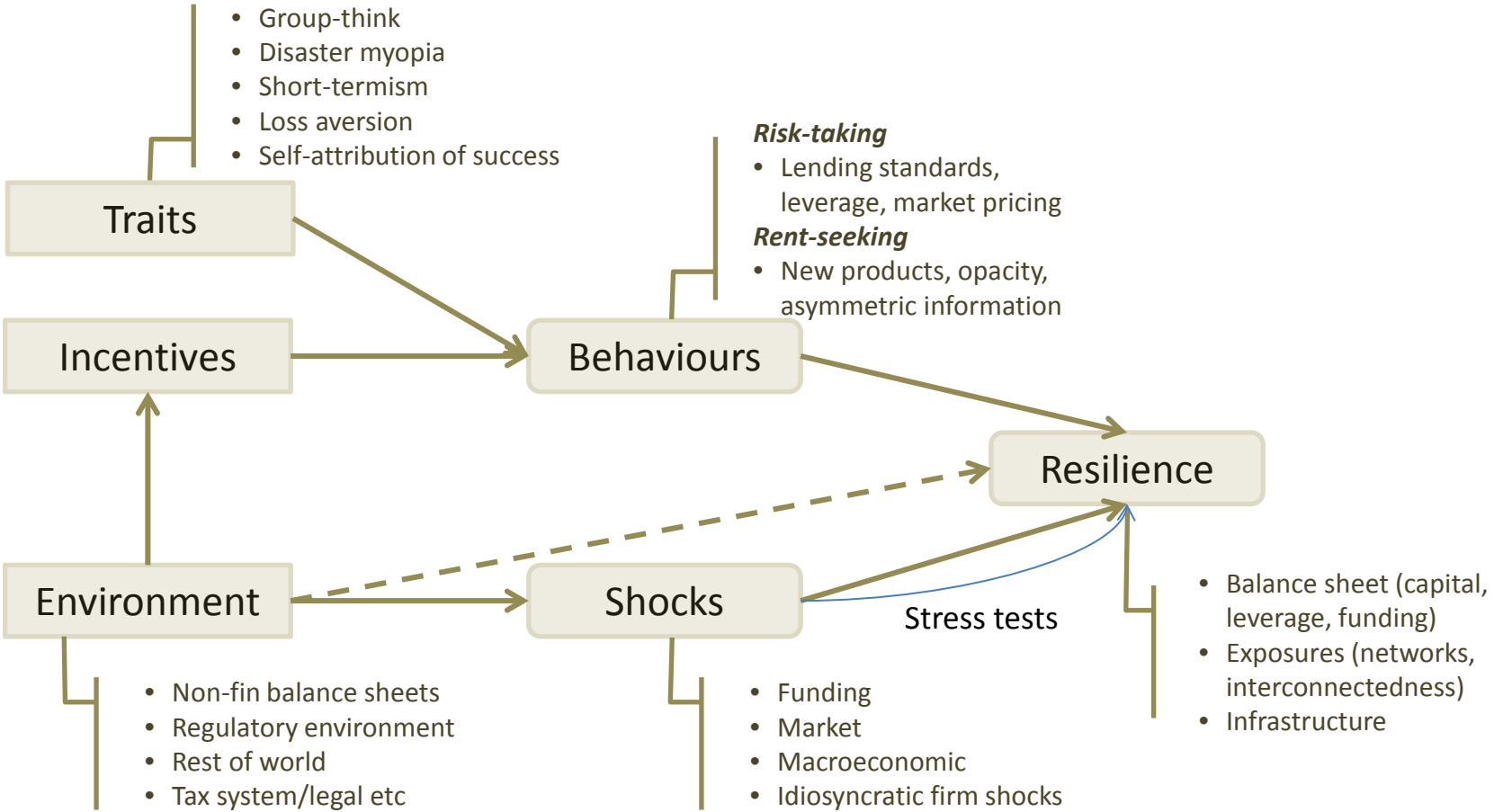
DSGEs not a good fit

- Representative agent
- Infinitely lived
- Full information about the system

Existing alternatives

- Balance sheet analysis (after Wynne Godley)
- Kindleberger–Minsky financial cycles
- Asymmetric information, contract design, fraud
- Agent-based modelling (e.g. networks)

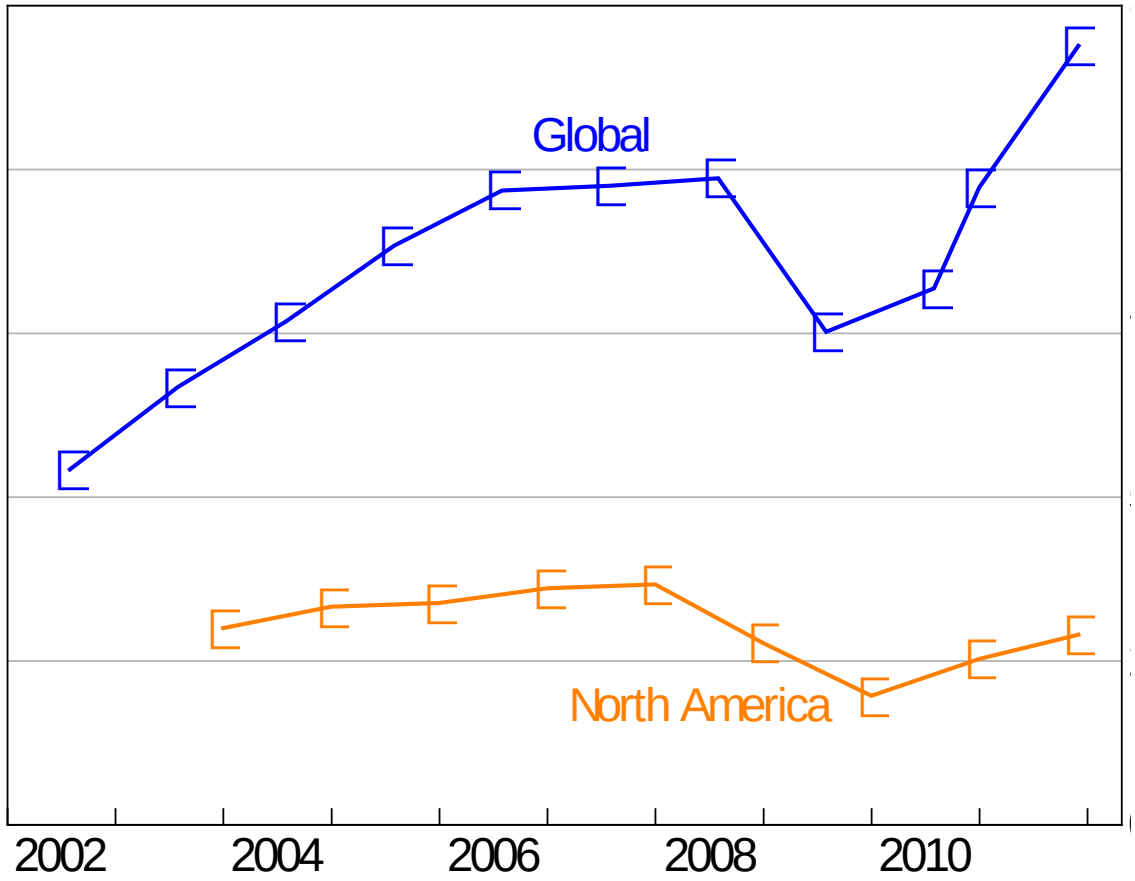
Focus on the behaviours!


Group-think
Disaster myopia
Short-termism
Loss aversion
Self-attribution of success
Traits
Risk-taking
Lending standards, leverage, market pricing
Rent-seeking
New products, opacity, asymmetric information
Incentives
Behaviours
Resilience
Environment
Shocks
Stress tests
Balance sheet (capital, leverage, funding)
Exposures (networks, interconnectedness)
Infrastructure
Non-fin balance sheets
Regulatory environment
Rest of world
Tax system/legal etc
Funding
Market
Macroeconomic
Idiosyncratic firm shocks

Lesson 6: Be a bit sceptical about some of the proposed tools

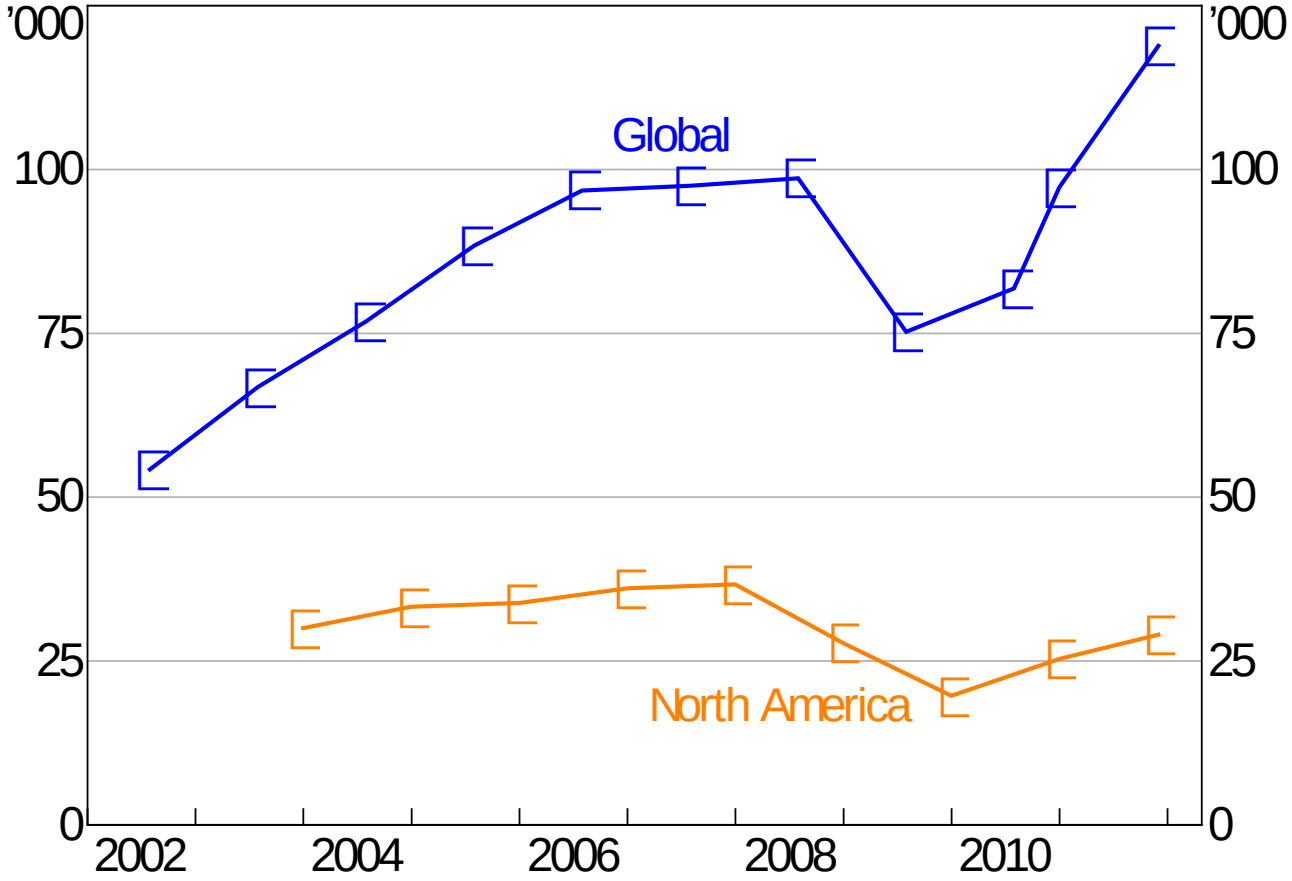
- Symptoms or causes?
- Where do the risks really lie?
  (Too much emphasis on housing?)
- Overly focused on numerical metrics?
- Compatible with good management of credit risk?
- Independent evaluation?
- Results on effectiveness only capturing intermediate targets?

Should this variable be a target of macroprudential policy?



Porsche Sales

Annual



Source : Wikipedia

Conclusion

- **Crisis has vindicated a broader (macro?) approach to supervision**
- **Broaden mandate, avoid ‘tick-a-box’ compliance mentality**
- **Don’t all crowd into untested proposals**

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Financial Stability and Macroprudential Policy

Luci Ellis

Head of Financial Stability Department

Reserve Bank of Australia

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Background and Outline

- Lessons from the crisis: why financial stability matters, new analytical approaches
- Macroprudential policy: international interest, APRA/RBA paper
- This presentation
  - What is financial stability?
  - Why does it matter?
  - How do we detect threats to financial stability?
  - What can we do in response?
  - Where does macroprudential policy fit in?

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WHAT IS FINANCIAL STABILITY?

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No consensus definition

- More than just the absence of crisis
  - Need to define a crisis: large bank failure/ stream of bank failures, or something more? Market volatility? Or combination of them?
- Probability of crisis is low
- Resilience to external shocks is high
- Internally created problems unlikely
- **Financial system is performing its functions for the real economy, and not harming (or likely to harm) the real economy**

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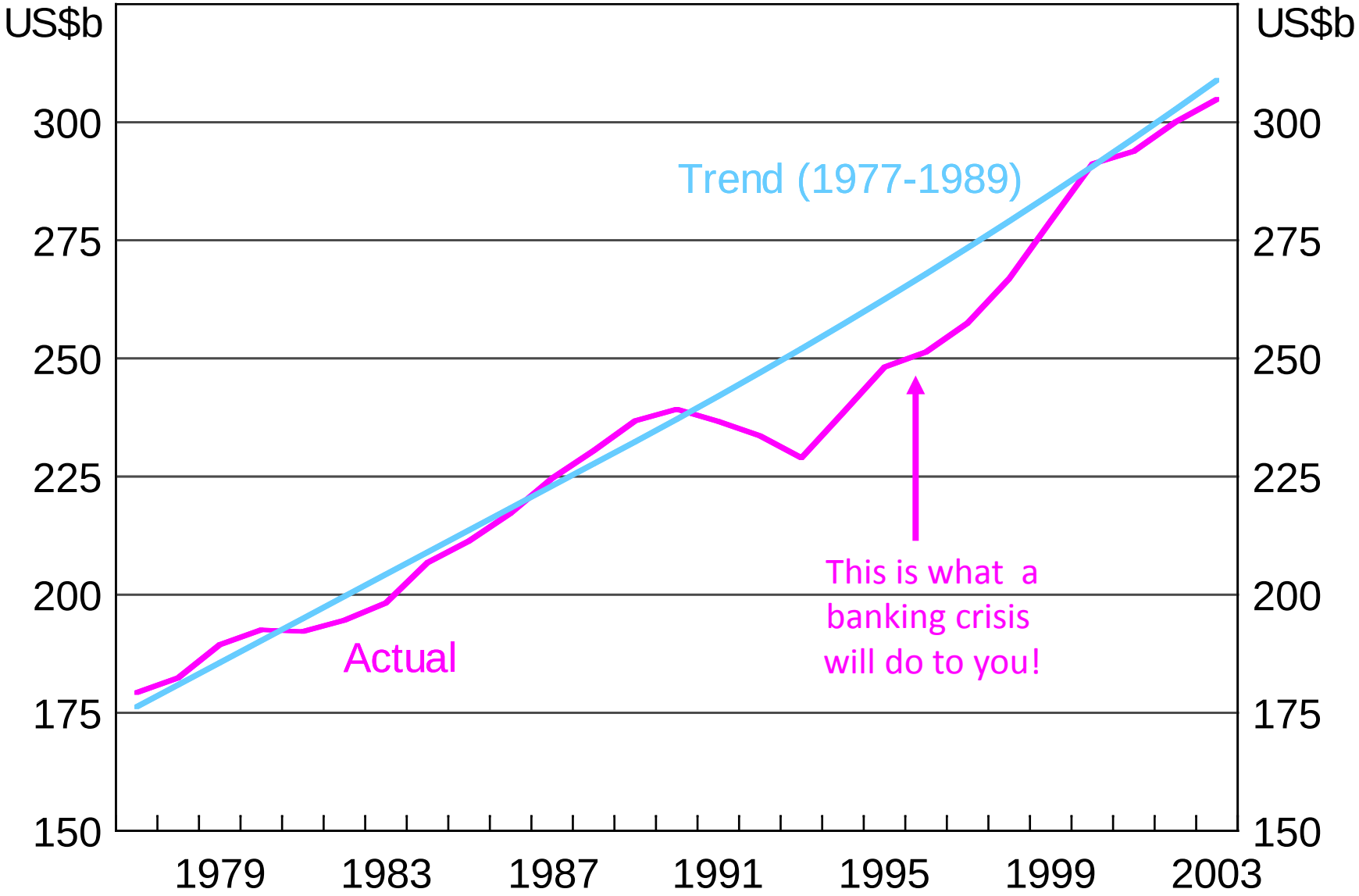
WHY DOES IT MATTER?

Sweden - GDP

Converted to US$ at 1995 prices and PPP exchange rates



Source: OECD


northern rock
northern rock


LAIKI BANK
24h ATM
LAIKI BANK

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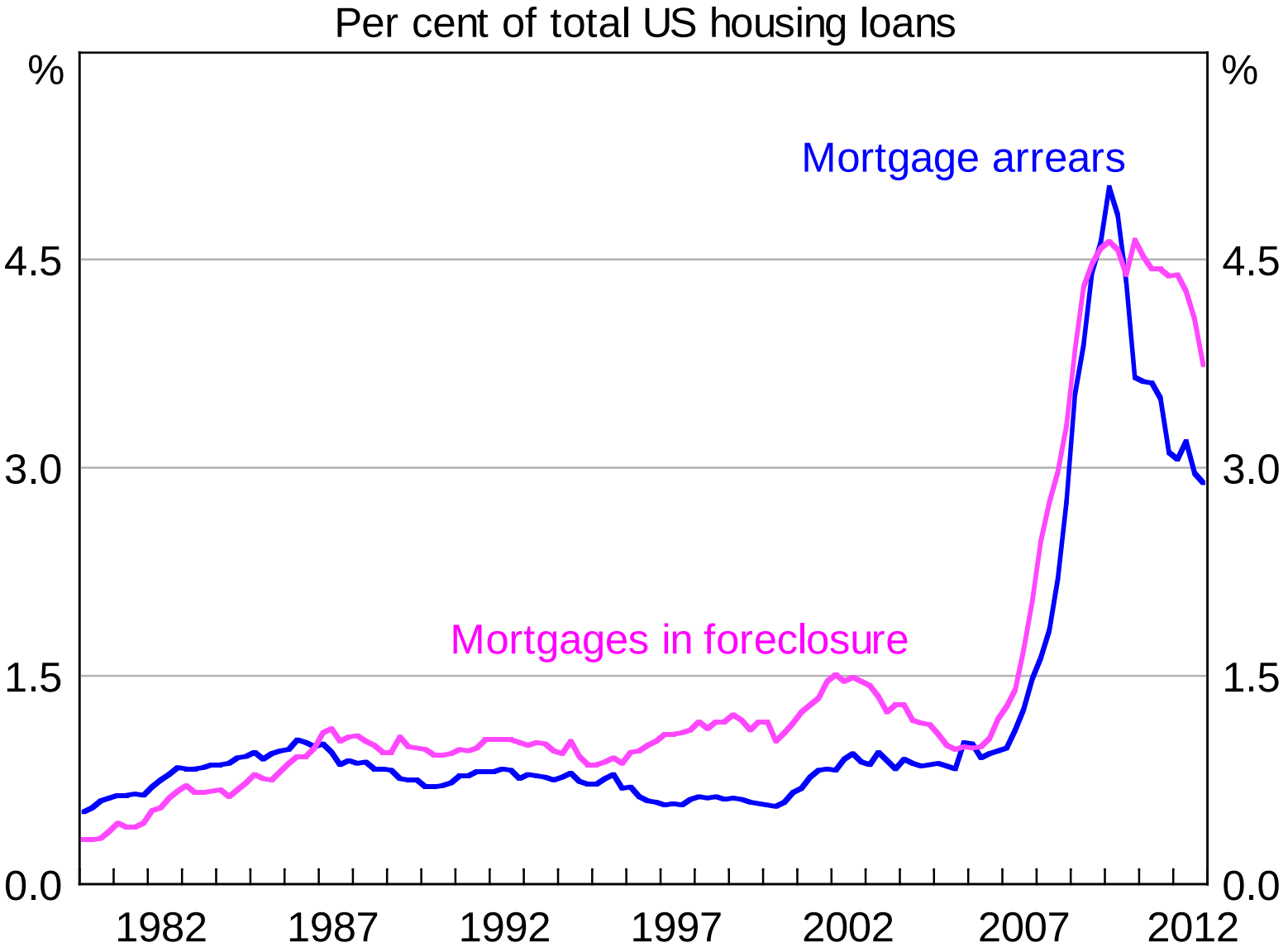
US – Mortgage Arrears and Foreclosures



Source: Mortgage Bankers Association

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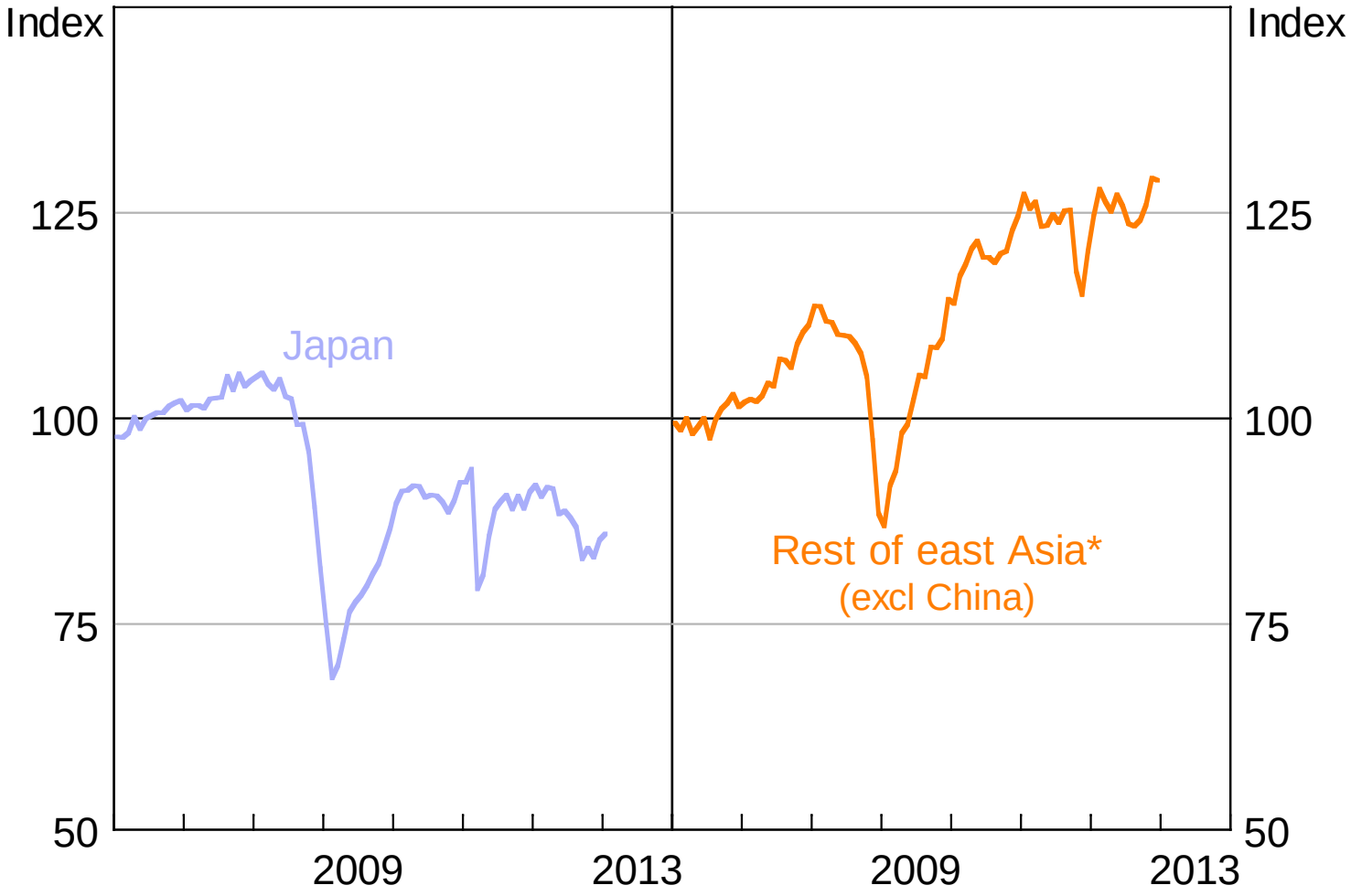
East Asia – Industrial Production

2006 average = 100



* Malaysia, Philippines, Singapore, South Korea, Taiwan and Thailand

Sources: CEIC; RBA; Thomson Reuters; United Nations

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HOW CAN WE DETECT THREATS TO FINANCIAL STABILITY?

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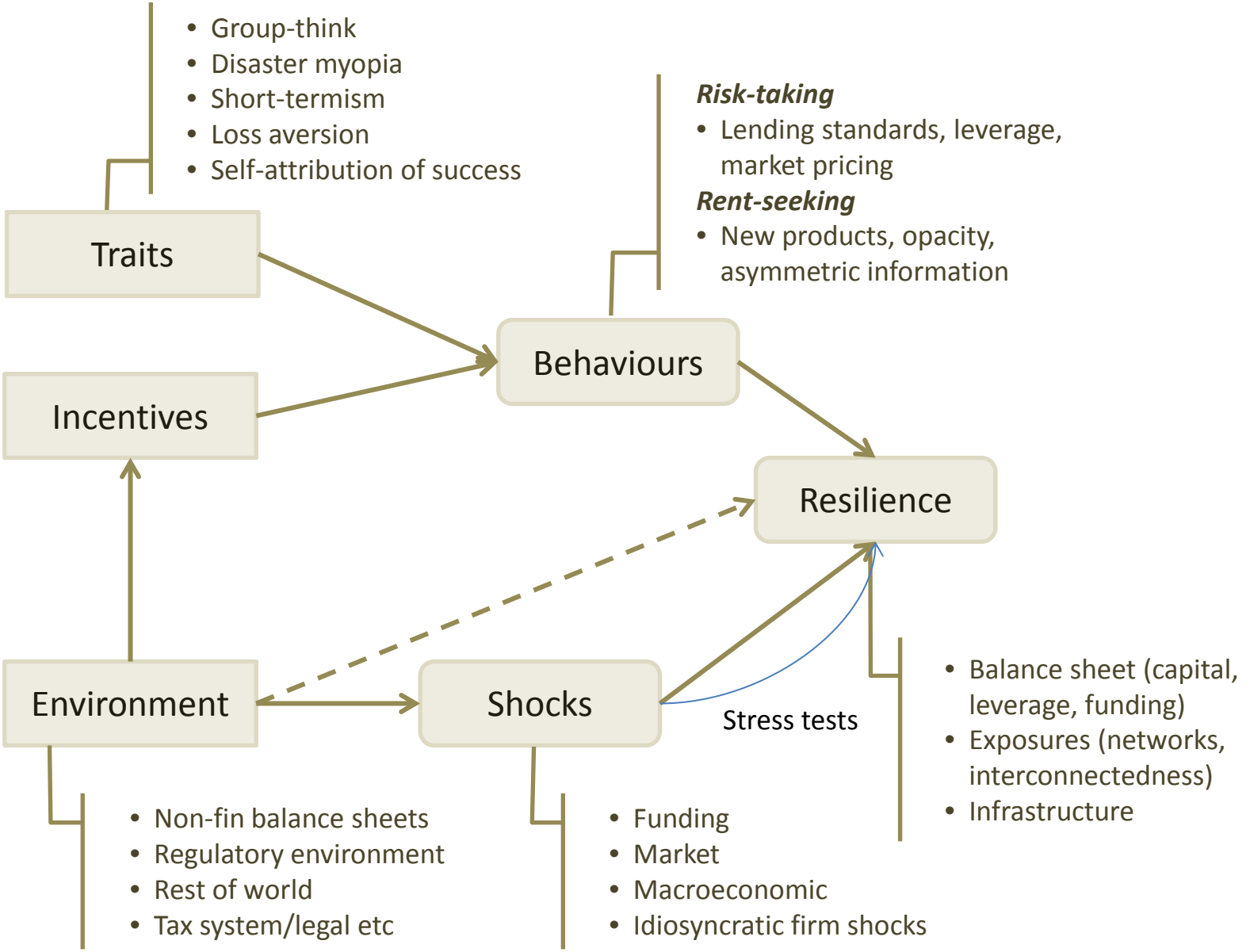

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The sort of data we look at

- Credit, borrowing and leverage
  - Balance sheet structure more generally (including liquidity)
  - Income generation and debt-servicing
- Lending standards
- Asset quality (e.g. loans in arrears)
- Asset concentration (exposures)
- Asset prices, price of risk (spreads)

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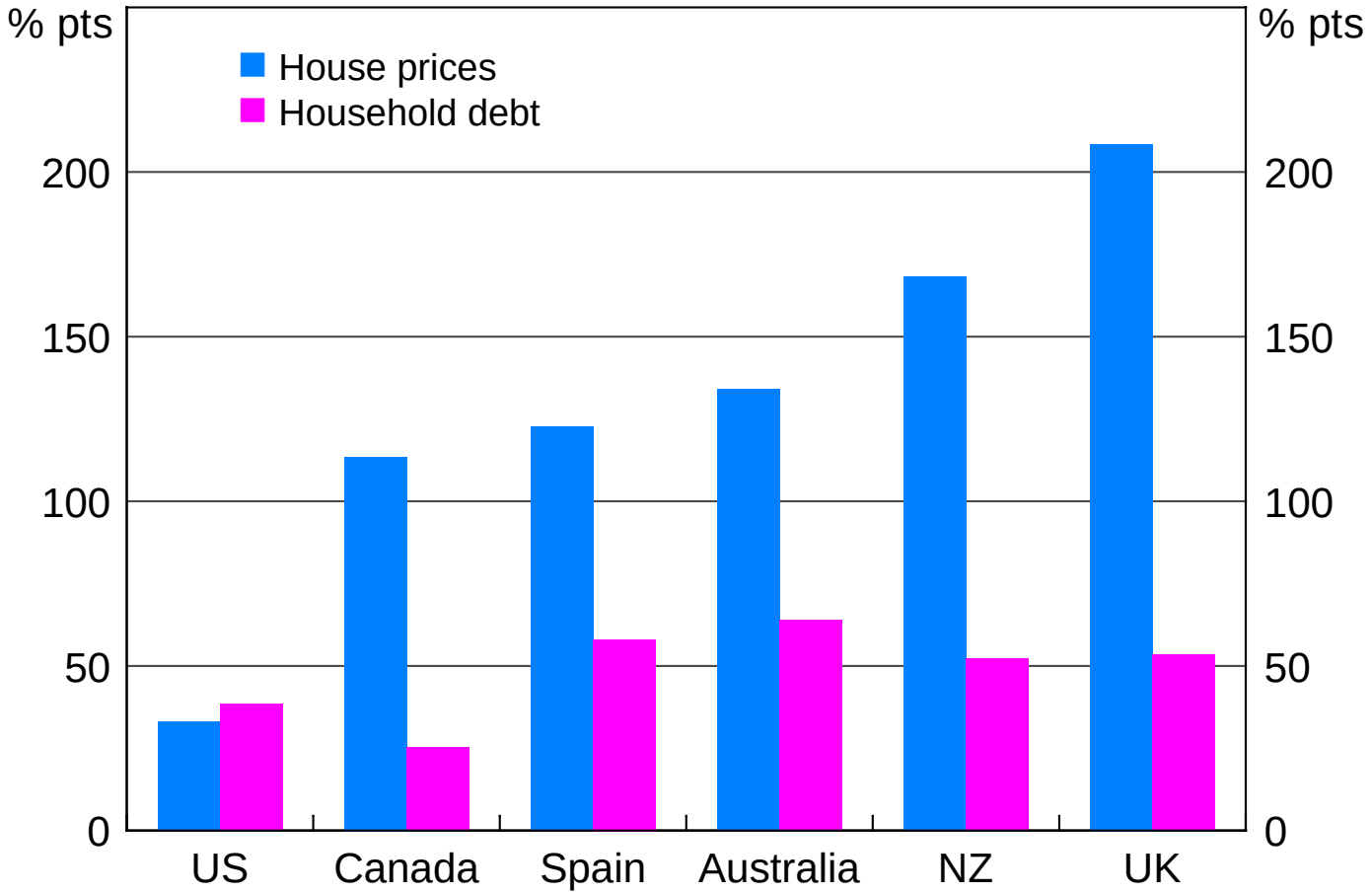
Aggregate data useful, but only go so far

House Prices and Household Debt

Percentage point change in ratios to household income*
(2000 to 2006)



* Household income is after tax, before interest payments.

Sources: BIS; Standard & Poor's; national sources

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WHAT CAN CENTRAL BANKS DO ABOUT FINANCIAL INSTABILITY?

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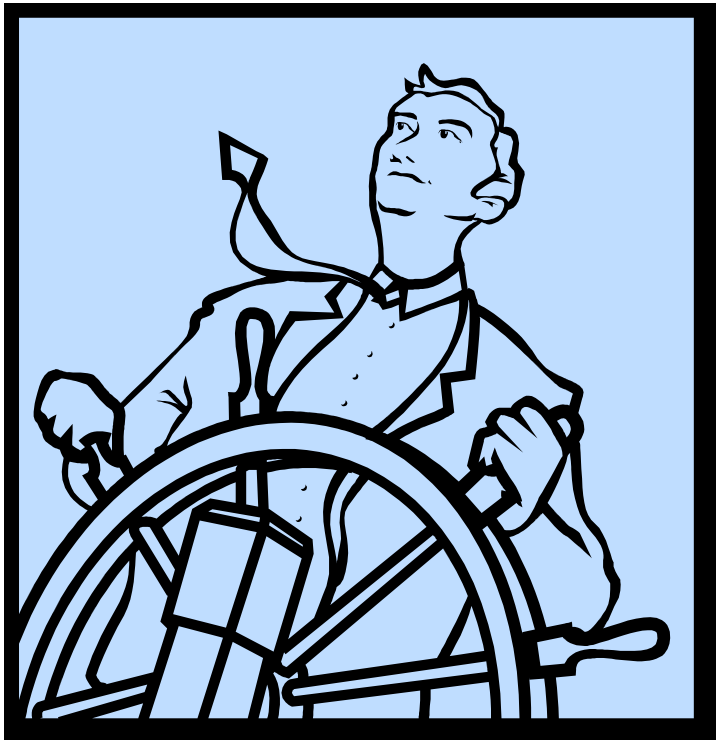
Financial stability policy is not like monetary policy

Monetary policy



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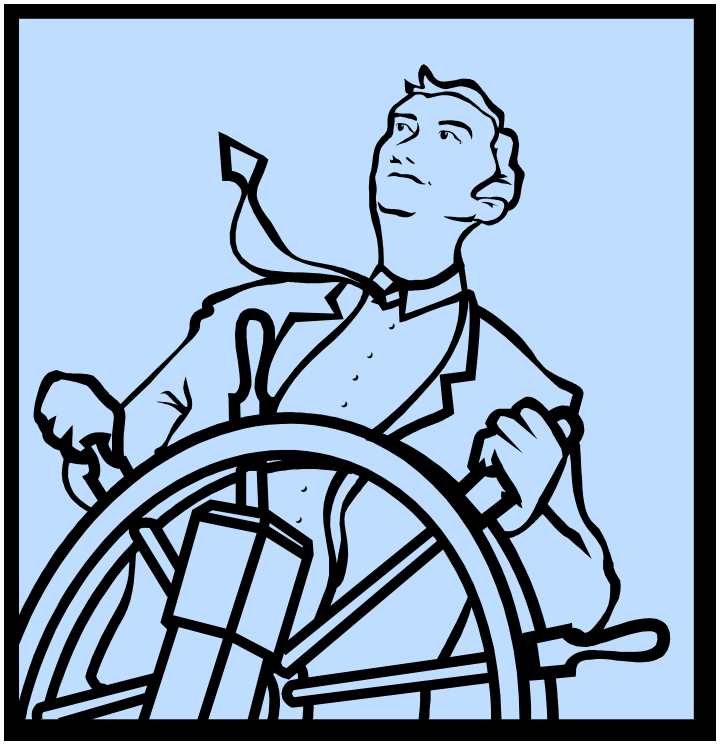
Financial stability policy is not like monetary policy

Monetary policy



Financial stability policy

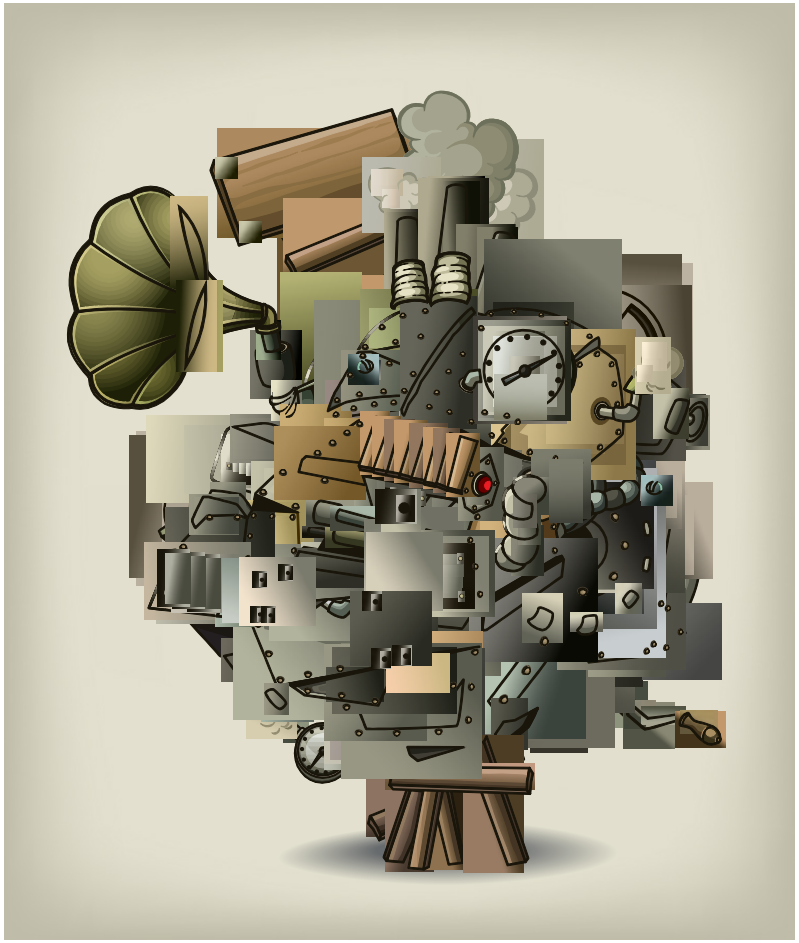


Image: Shutterstock.com

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Before a crisis

- Analysis
- Supporting prudential supervisor
  - Peer/industry analysis
  - Integrating macroeconomic and financial analysis
- Communication to influence 'animal spirits' of risk-taking

➢ See joint RBA/APRA paper

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The approach to analysis must be eclectic

DSGEs not a good fit

- Representative agent (usually)
- Infinitely lived
- Full information about the system

Existing alternatives

- Balance sheet analysis (after Wynne Godley)
- Kindleberger–Minsky financial cycles
- Asymmetric information, contract design, fraud
- Agent-based modelling (e.g. networks)

Focus on the behaviours!

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Supporting the supervisor

Image: RetroClipArt/Shutterstock.com

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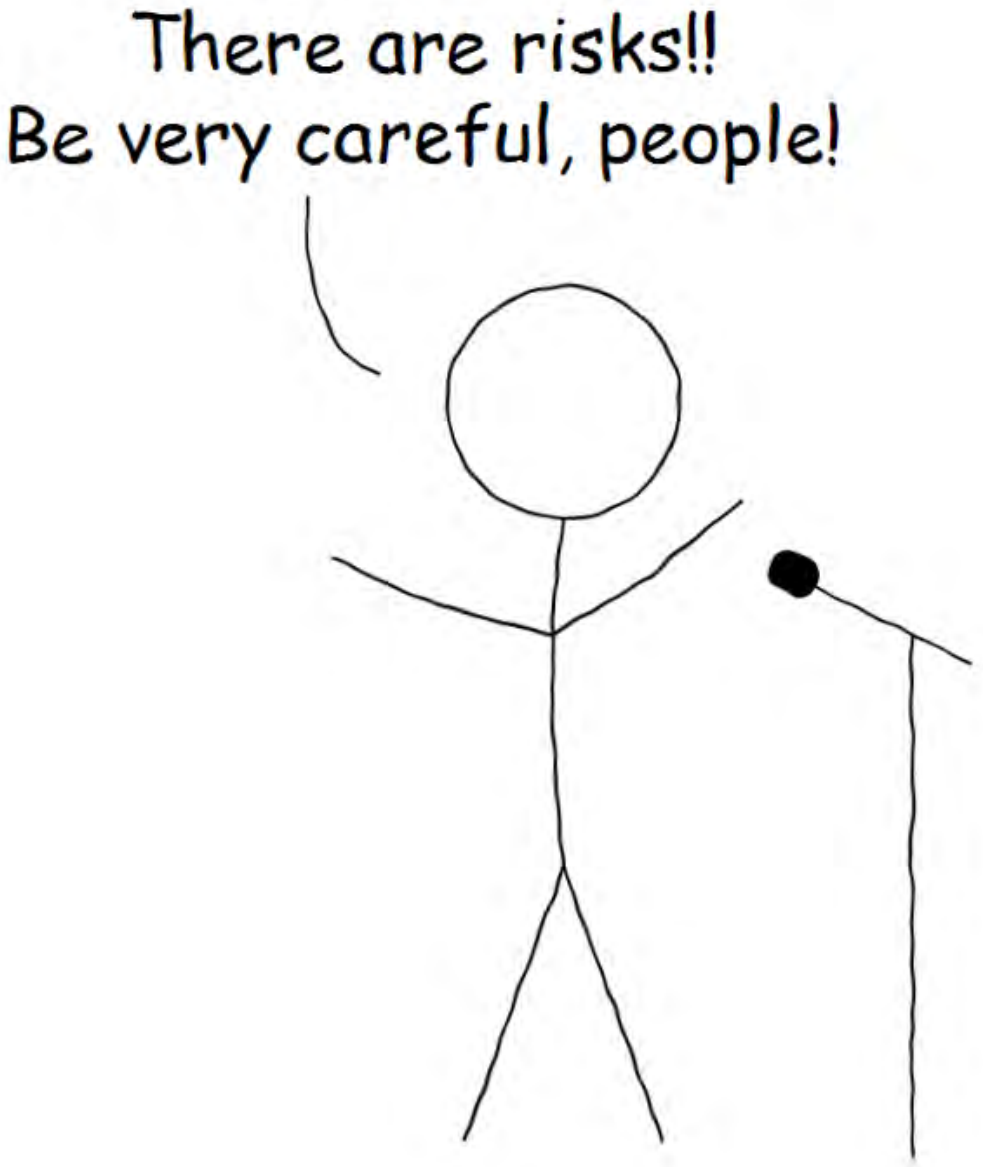
Communication about risks



Sources: RBA; mathematica.stackexchange.com; apologies to Randall Munroe

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During a crisis

- Liquidity provision, including lender of last resort
- Analysis of sector conditions and individual firms (not just banks)
- Overseas examples:
  - Buying toxic (or non-toxic) assets
  - Helping restructure distressed banks

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WHERE DOES MACROPRUDENTIAL POLICY FIT IN?

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Definition and Context

- Primarily prudential tools used to promote financial stability
- Looks at whole system
- Through-the-cycle vs cross-section
- Subject of international interest and debate, if little clarity in definitions

➢ But is this separate from financial stability policy framework, or part of it?

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Australia takes a different view?

- Most of the countries looking at these tools can't or won't use interest rates
  - Is there even a model that has a higher "neutral" interest rate for asset markets than for the real economy?
- We agree that good prudential supervision involves taking a macro view
- RBA not in the business of overriding APRA's prudential bailiwick
- We don't think a fixed toolkit of levers and buttons is a good way to go about it

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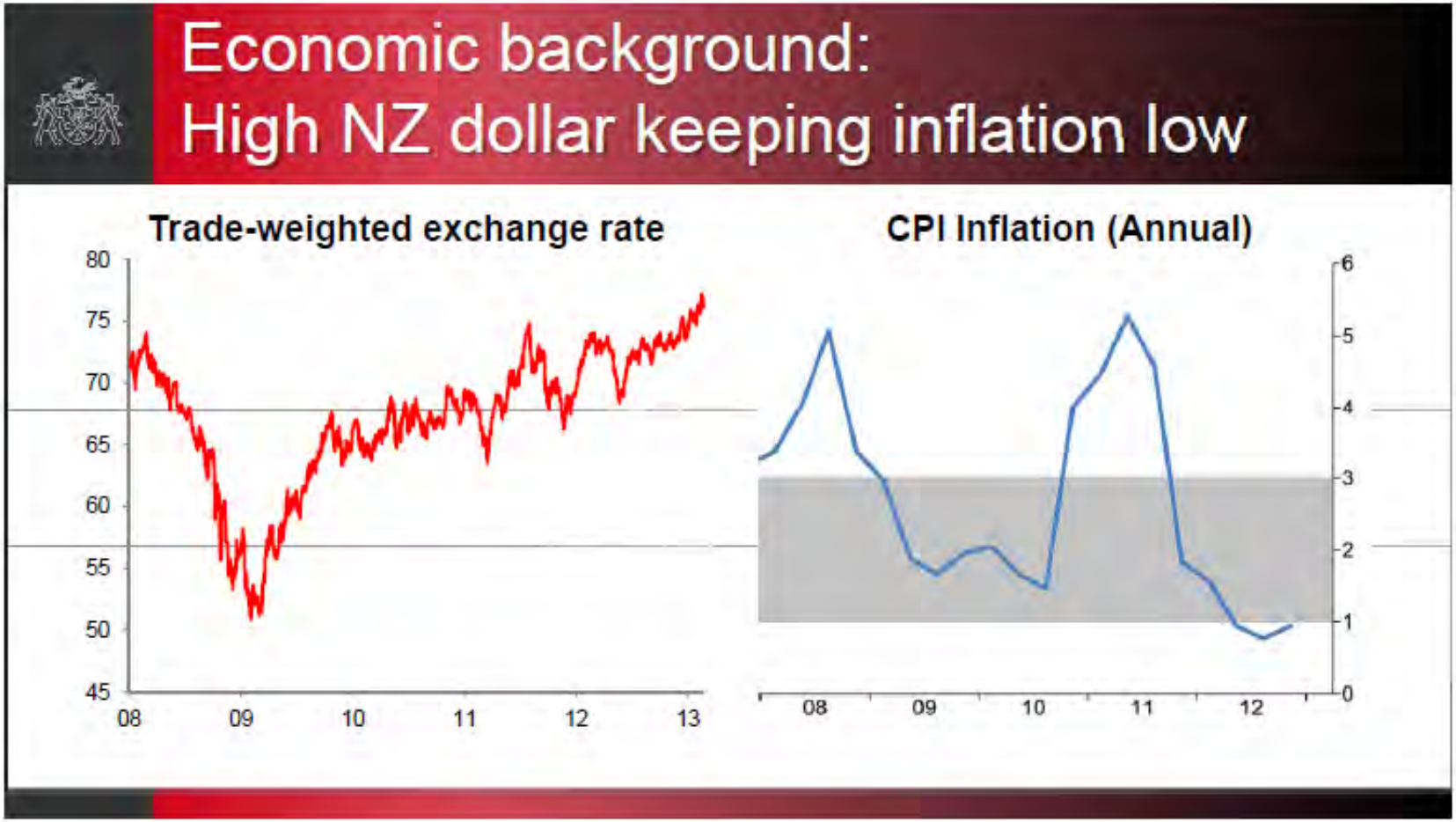
Do we need another cyclical tool?

- If the *overall* prudential framework is well designed
- If the exchange rate regime allows you to run monetary policy appropriately to domestic conditions
- And if the forecast horizon allows you to run monetary policy to hit a medium-term inflation forecast, after the ER effects have washed out

… do you really need a "something else" to lean against the credit manifestation of the business cycle?

RBNZ introducing macroprudential framework



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A macro-perspective is needed for *competent* prudential supervision

Not competent

Image: RetroClipArt/Shutterstock.com

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This is much better

Image: RetroClipArt/Shutterstock.com

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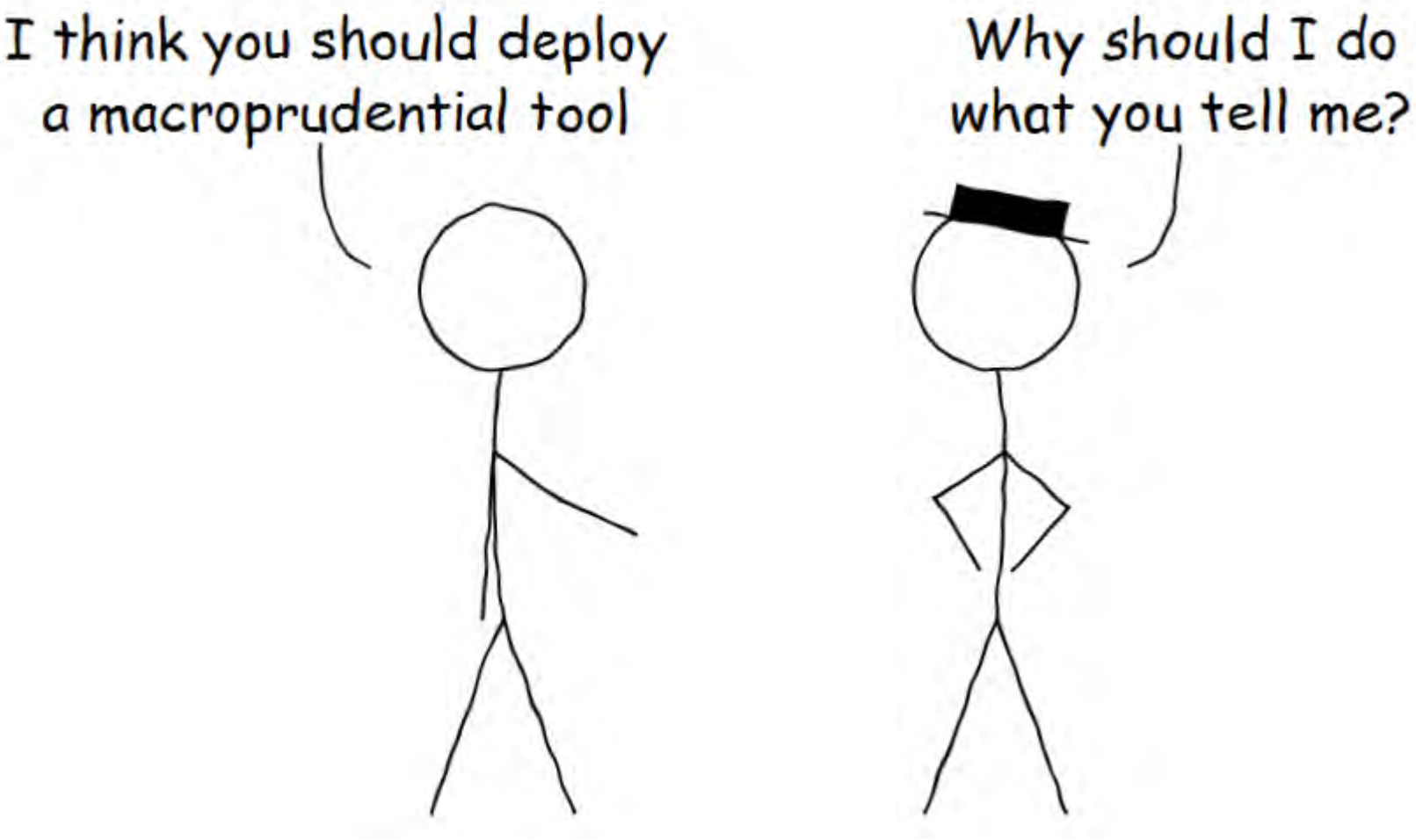
Avoiding dysfunctional interagency relationships



Source: RBA; mathematica.stackexchange.com; apologies to Randall Munroe

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Possible macroprudential tools

Already used

- LTV/DSR caps on mortgages
- Countercyclical capital buffer
- Risk weight changes
- SIFI capital surcharges
- Transaction taxes/bans
- FX borrowing limits
- Dynamic provisioning

Others proposed

- Countercyclical margins and haircuts
- Countercyclical reserve requirements
- Large exposure limits

Many of them good (micro)prudential practice

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Be a bit sceptical about some of the proposed tools

- Symptoms or causes?
- Where do the risks really lie?
  (Too much emphasis on housing?)
- Overly focused on numerical metrics?
- Compatible with good management of credit risk?
- Independent evaluation?
- Results on effectiveness only capturing intermediate targets?

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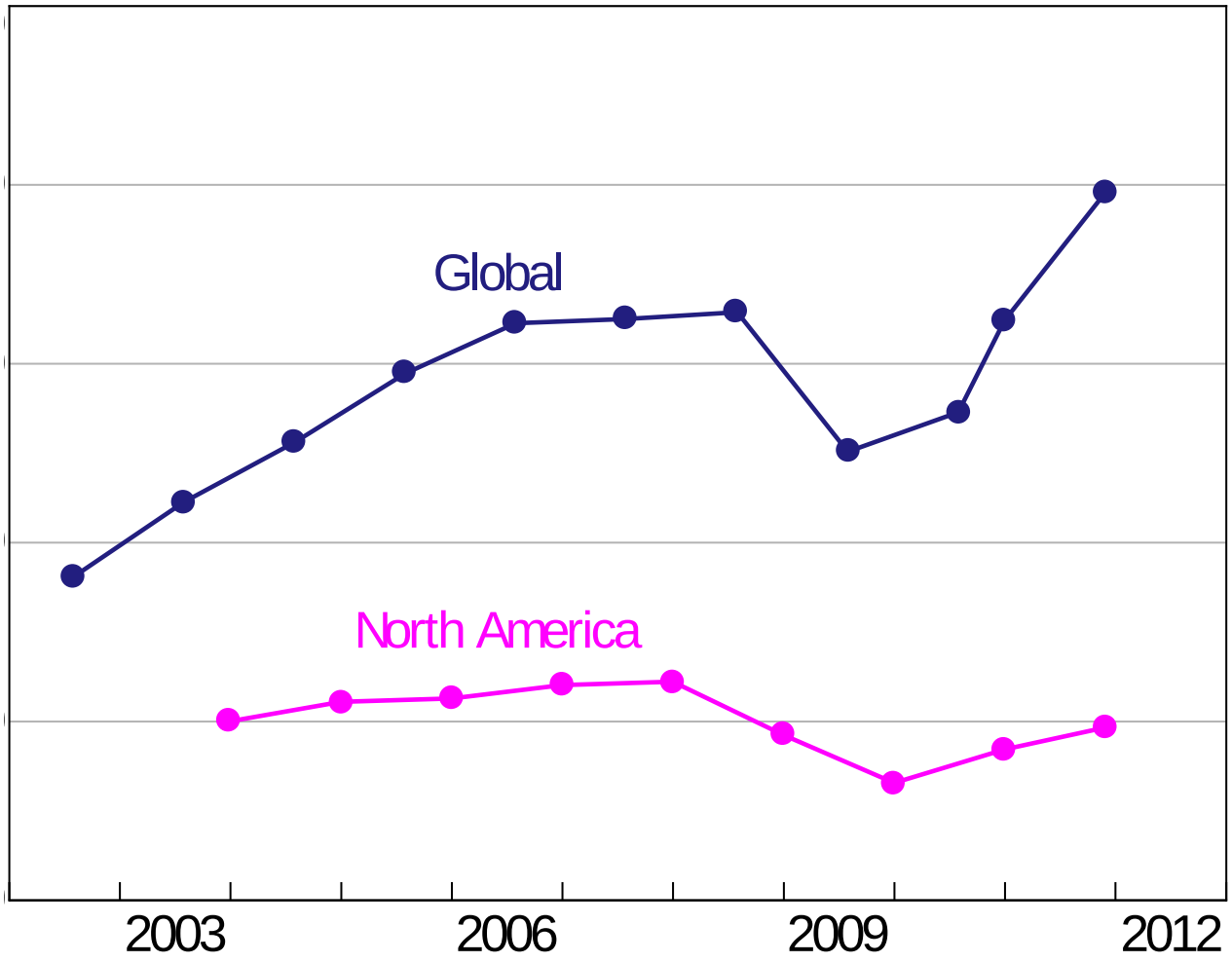
Should this variable be a target of macroprudential policy?



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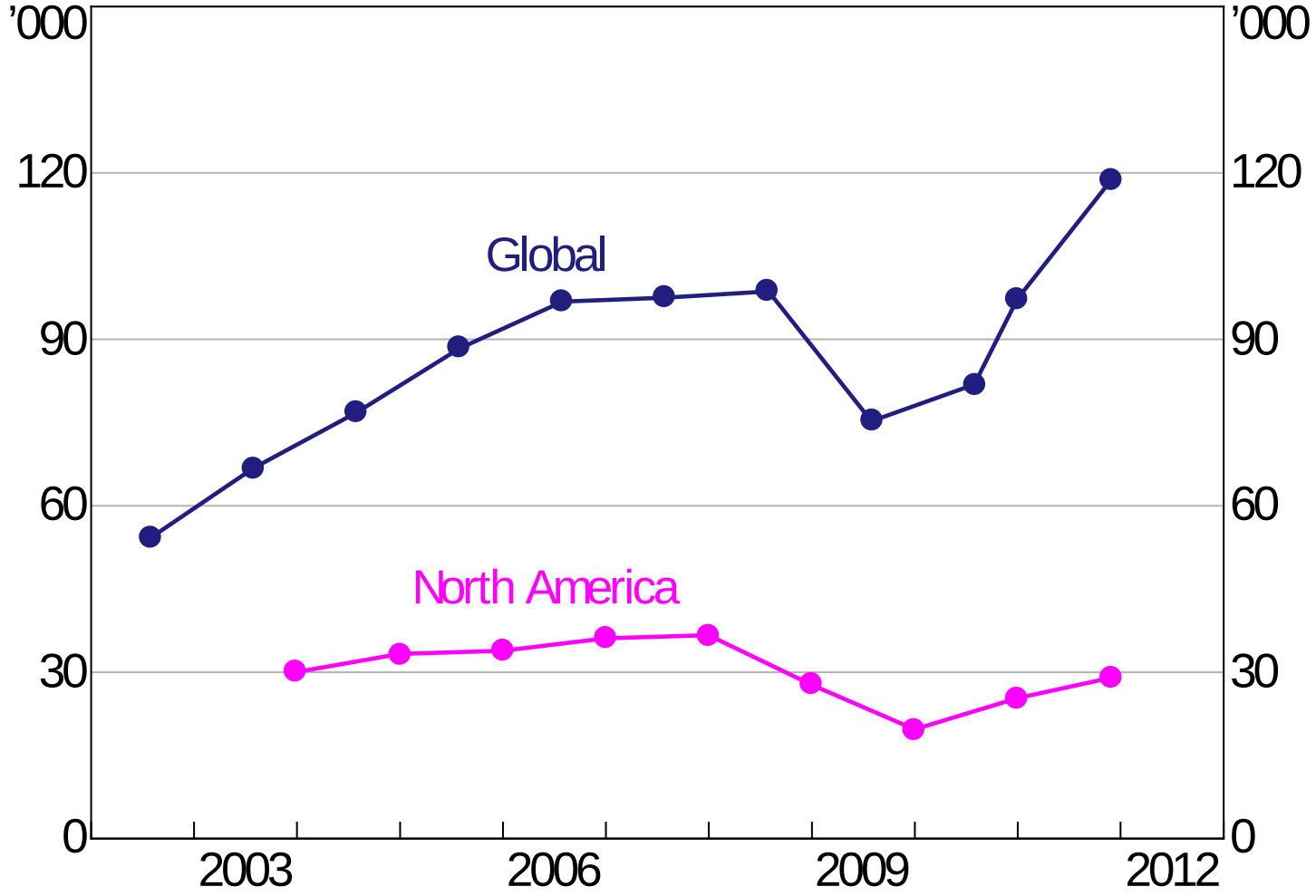
Porsche Sales

Annual



Source : Wikipedia

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Looking forward

- A lot we don't know about how to model financial system and measure the risks to its stability
  - Period of analysis and learning
- Period of massive regulatory change and implementation
  - Possible unintended consequences
- It's good to be in a growth industry!

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Q&A

The Use and Effectiveness of Macroprudential Tools

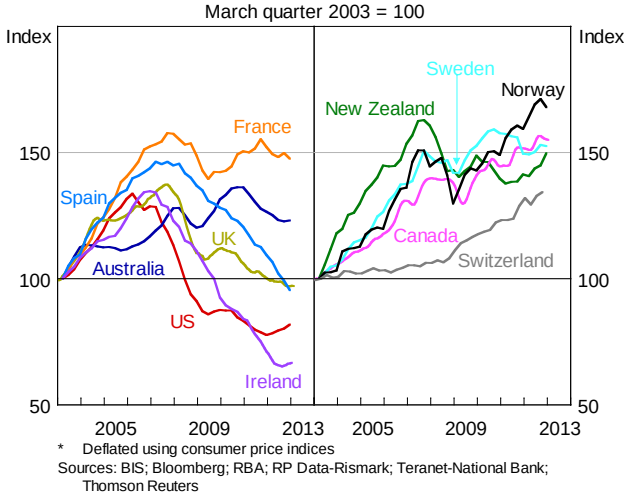
Emerging market economies have relatively more recent experience in using loan-to-valuation ratio (LVR) caps, reserve requirements and other system-wide policy instruments to try to contain rapid growth in credit and asset prices. These types of tools are now commonly referred to as macroprudential policy instruments (MPIs) because their use has typically been motivated by macroprudential concerns. Following the recent financial crisis, a few advanced economies have begun to use MPIs, but on the whole their use remains relatively low among these economies. Unsurprisingly, policymakers using MPIs have offered favourable assessments of their effectiveness. The empirical literature seems to agree that MPIs can be effective, to an extent. Having said that, the literature acknowledges weaknesses in statistical methods and identifies some spillovers (or means of circumvention) that can complicate the use of MPIs. That some policymakers are now into their fourth or fifth rounds of MPI tightening also suggests some uncertainties in their timing and calibration. A further limitation is that the notion of macroprudential policy has taken on new meaning since the crisis, and what some studies term 'macroprudential tools' could just as well be described as one-off recalibrations of the normal prudential framework. It is likely too early to judge how effective MPIs are in advanced economies, particularly given many of the tools are yet to be fully deployed and the full-cycle effects not apparent.

The use of macroprudential tools

Use of macroprudential policy instruments (MPIs) is not new. Table A1 in the appendix summarises the use of MPIs across a wide sample of countries, many of them emerging market economies (reproduced from an IMF study by Lim et al. (2011)). Emerging market economies have a history of trying to contain rapid growth in credit or property prices using MPIs, often because their exchange rate regime constrains their use of monetary policy, or because their monetary policy frameworks are less established. Some of the MPIs listed include: reserve requirements; limits on banks' foreign exchange lending; and restrictions on their foreign currency or maturity mismatches. Loan-to-valuation ratio (LVR) caps have been used widely (particularly in Asia) and, to a lesser extent, minimum requirements for loan-loss provisioning. Limits on banks' dividend payments and adjustments to their capital adequacy requirements have seen less use. It has also been common for policymakers to use a combination of MPIs in successive periods of loosening or tightening (Table A2 sheds some light on the latter point (taken from Borio and Shim (2007)).

The use of MPIs by advanced economies has been less prevalent in recent times, or at least after the financial deregulation that occurred progressively through the 1970s, 1980s and 1990s. In the wake of the crisis, policymakers in a number of countries have revised their prudential frameworks to include an explicit role for macroprudential policy. The EU, the UK and the US have each created a macroprudential policy committee, similar in form to Australia's Council of Financial Regulators, whose job is, *inter alia*, to deploy MPIs where necessary to head off financial stability risks.[1] No significant interventions by these committees have taken place to date. Elsewhere, a number of countries have announced their use of MPIs, although some of them are yet to be deployed (examined in Box 1 below and summarised in Table A3).

Graph 1
Real Residential Property Prices*
March quarter 2003 = 100



* Deflated using consumer price indices
Sources: BIS; Bloomberg; RBA; RP Data-Rismark; Teranet-National Bank; Thomson Reuters

In choosing to deploy macroprudential measures, these countries share a few common threads. The first is their motivation: in nearly all cases, policymakers are

[1] The European Systemic Risk Board (ESRB) in the EU; Financial Policy Committee (FPC) in the UK; and Financial Stability Oversight Council (FSOC) in the US.

acting to stem rapid increases in some combination of residential property prices, household credit and household indebtedness (Graph 1). In a few countries, risks from the property sector are being amplified by the global 'search for yield', which has spurred greater investor- and foreign-led investment in local property markets. The second commonality is their set of limitations, in particular the stance of monetary policy. In most countries interest rates have been kept low to stimulate aggregate demand or contain appreciation of the exchange rate (or both), even though inflation is in some cases relatively high. Policymakers have generally, in the first instance, tightened underwriting standards and imposed limits on high-LVR loans in an attempt to reduce risks from particular segments of the market. A few countries have targeted resilience, instead, by forcing banks to hold more capital to protect them against a possible surge in loan losses.

Box 1: Recent Use of Macroprudential Tools

Canada: In June 2012 the Canadian Ministry of Finance and Bank of Canada implemented their fourth round of macroprudential tightening, having begun in July 2008. Policy changes have focused on tightening the criteria for government-guaranteed mortgage insurance, including by capping LVRs and debt-servicing ratios (DSRs) and reducing maximum loan amortisation periods (from 40 to 25 years).

Switzerland: The Swiss National Bank (SNB) announced in February that Switzerland will implement the Basel III counter-cyclical capital buffer. Swiss banks have until October to raise an additional amount of common equity Tier 1 capital equal to 1 per cent of their risk-weighted exposures to Swiss home loans. Of note here is the disagreement of the Swiss authorities. Previously, the SNB had spoken publicly about using the buffer once it became operational in July 2012. FINMA (the prudential regulator) later said, however, that it would have preferred to delay implementing the buffer; it had just overseen a tightening of mortgage standards which had yet to flow through the market. Their disagreement notwithstanding, Switzerland remains the only country to have implemented the buffer (albeit only on a sectoral basis), although some other countries, including Norway and New Zealand, have taken steps to become operationally ready.

Sweden: The Swedish Financial Supervisory Authority (Swedish FSA) will apply a floor on risk weights for Swedish home loans (calculated under the internal-ratings based (IRB) approach) at 15 per cent.[3] The Norges Bank has proposed a similar requirement for **Norwegian** banks.

New Zealand: In similar fashion to the Swedish and Norwegian authorities, the RBNZ announced in May that it will increase the minimum risk weights that apply to new and current high-LVR home loans under the IRB approach. The increase takes effect from October and is expected to increase the four major banks' capital requirements for home loans by about 12 per cent. It is worth noting how fast the RBNZ is moving: it released a consultation paper on its new macroprudential framework in March, with a small window for comments; announced its first macroprudential intervention on 8 May; agreed a Memorandum of Understanding with the Minister of Finance a week later (16 May); and announced its final policy position the next day (17 May).

Israel: Since July 2010, the Bank of Israel (the prudential regulator) has progressively tightened its macroprudential stance: it toughened loan-loss provisioning requirements and risk weights for high-LVR home loans; and it capped LVRs on home loans at 75 per cent for first-home buyers and 50 per cent for investors.[4]

Turkey: The prudential regulator (BRSA) undertook a number of macroprudential measures between 2008-2011, including: limiting banks' dividend payments; capping LVRs on residential property loans (75 per cent) and commercial property loans (50 per cent); increasing risk weights and minimum loan-loss provisioning requirements for consumer loans; and increasing capital requirements for interest rate risk.

[3] Although the risk-weight floor has been widely recognised as a macroprudential measure, the Swedish FSA described it as simply being a Pillar II requirement. APRA included something similar (a higher floor on loss-given-default) in its implementation of Basel II from the outset.

[4] Recently, at an unscheduled policy meeting on 13 May, the Bank of Israel announced it would intervene in the exchange rate; it also referenced a continuation of its macroprudential settings, but didn't announce anything new.

In Asia, **Hong Kong**, **Singapore** and **South Korea** each have a history of using macroprudential tools. Hong Kong began using LVR caps in the early 1990s to try to mitigate risks from its residential property market; South Korea has acted similarly since 2002. **Singapore** implemented its first set of macroprudential measures in September 2009, followed by numerous rounds of tightening over the period to January of this year. The Singaporean authorities have implemented limits on LVRs and amortisation periods and certain fiscal policies targeted at repeat home buyers and foreign investors, such as increases to stamp duty. **South Korea** has recently sought to reduce banks' foreign currency and maturity mismatches by imposing a levy on their non-deposit foreign currency liabilities and capping their leverage (via foreign currency derivative positions). **Hong Kong** introduced its latest round of measures in February, lowering LVR caps for commercial property loans and, as in other countries, imposing a risk-weight floor of 15 per cent on home loans for banks that use the IRB approach.

The effectiveness of macroprudential tools

There is no simple yardstick for measuring effectiveness. Borrowing from CGFS (2012), one way to think about effectiveness is to consider whether the policymaker has achieved their *stated objective*, in good *time*, and without undue *negative externalities*.

Stated objective

Achieving the stated objective requires a robust link between the MPI and the target variable – credit or asset prices, for example. (This assumes that these variables should be a target of policy.) Along those lines, certain policymakers have generally offered favourable self-assessments of the effectiveness of their macroprudential policies, to little surprise. In their view, MPIs have successfully been used to slow credit or asset price growth somewhat, or at the very least have reigned in imprudent practices and built up banks' resistance to turns in market conditions (Borio and Shim, 2007). Policymakers from Canada, Hong Kong, Israel, Singapore and South Korea have made favourable assessments of the effectiveness of their recent (post-crisis) macroprudential measures, pointing to *prima facie* evidence that target behaviours have changed in response to the use of MPIs, at least temporarily.[5]

There are a few studies that examine the causal link between instrument and objective, summarised below and in Tables 1 and 2.[6] The empirical literature, though small, seems to agree that MPIs are effective, to an extent.

- Lim et al. (2011) use three analytical approaches to conclude that, on balance, MPIs can be effective. First, in their *case studies*, the authors evaluate the macroprudential policies of seven jurisdictions and judge them to be mostly effective.[7] It must be said, however, that many of the so-called MPIs resemble one-off changes to prudential regimes – for example, the introduction of the leverage ratio in the US in the early 1990s. Second, the authors use *event studies* to examine growth in credit and house prices before and after MPIs are deployed. The event studies suggest that the most effective MPIs are LVR and DSR caps, dynamic provisioning and reserve requirements (other tools appear to have limited effect). Third, they use data from an IMF survey to conduct *regression* analysis. Again, the results point to the effectiveness of the four MPIs mentioned above; other instruments, such as limits on banks' dividend payments and credit growth, had less obvious effects.
- Borio and Shim (2007) make similar conclusions. They, too, use event studies to illustrate simple relationships between MPIs and credit and asset price growth, which are broadly supported by a formal statistical analysis. However, as with Lim et al. (2011), the authors are quick to note holes in their statistical analysis, among them a small sample size. At best, they say, their results are *prima facie* evidence that MPIs can, to an extent, contain booms in credit and asset prices.

[5] The use of MPIs by a number of advanced economies was discussed at an April IMF seminar and, more recently, the May meeting of the FSB AGV.

[6] In a review of the literature, Galati and Moessner (2011) note that empirical studies on the effectiveness of MPIs are few. Individual case studies appear to be quite popular, such as the use of dynamic provisioning in Spain, but there is little in the way of large, cross-country panel regression studies.

[7] The seven case studies are China, Colombia, Eastern Europe, New Zealand, South Korea, Spain and the US.

- Crowe et al. (2011) say the evidence on effectiveness is 'mixed'. They observe that: several emerging market economies failed to dampen boom/bust dynamics in their asset markets by varying banks' capital requirements and risk weights; dynamic provisioning in Spain had little impact on house prices and household indebtedness; and the use of LVR and DSR caps in Hong Kong and South Korea, while seemingly effective in the short term, had no lasting effect.
- Last, the recent CGFS (2012) paper on *Operationalising the Selection and Application of Macroprudential Instruments* uses the various Basel III Quantitative Impact Studies (MAG and LEI) to infer that the broad group of capital, liquidity and asset-based MPIs are, for the most part, effective.[8] The paper cites a number of recent supervisor and academic studies as further evidence, although in many instances their conclusions seem more circumstantial than scientific.

Table 1: The Effectiveness of Macroprudential Policies*
By tool

	Overall	LVR and DSR caps	Lending caps	Provisions	Risk weights and capital	Reserve requirements
IMF (2011)						
Lim et al.						
Case studies	**Effective**	n/a	n/a	Effective	n/a	n/a
Event studies	**Mostly effective**	Mostly effective	Less effective	Effective	n/a	Effective
Regression	**Effective**	Effective	Not effective	Effective	n/a	Effective
Crowe et al.	**Mixed**	Mixed	n/a	Not effective	Mixed	n/a
CGFS (2012)	**Effective**	Mostly effective	n/a	Effective	Effective	Effective
BIS (2007) (Borio and Shim)	**n/a**	n/a	n/a	n/a	n/a	n/a

* Degree of effectiveness (mostly, less, not etc.) decided by the RBA where necessary; LVR = loan-to-valuation ratio; DSR = debt-servicing ratio
Source: RBA

Table 2: The Effectiveness of Macroprudential Policies*
By risk area

	Overall	Credit cycle	House prices	Household indebtedness	Overall resilience	Leverage
IMF (2011)						
Lim et al.						
Case studies	**Effective**	Effective	Effective	n/a	Effective	n/a
Event studies	**Mostly effective**	Mostly effective	Mostly effective	n/a	n/a	n/a
Regression	**Mostly effective**	Mostly effective	n/a	n/a	n/a	Mostly effective
Crowe et al.	**Mixed**	Mixed	Mixed	Mixed	Effective	n/a
CGFS (2012)	**Effective**	Some effect	Some effect	Effective	Effective	n/a
BIS (2007) (Borio and Shim)	**Some effect**	Some effect	Some effect	n/a	n/a	n/a

* Degree of effectiveness (mostly, less, not etc.) decided by the RBA where necessary; LVR = loan-to-valuation ratio; DSR = debt-servicing ratio
Source: RBA

[8] Reports produced by the Macroeconomic Assessment Group (MAG) and Long-term Economic Impact (LEI) working group assess the economic impacts of post-crisis international bank regulatory reforms.

There is limited room to draw conclusions about the effectiveness of MPIs used since the crisis. For one, the studies generally have small sample sizes, particularly in the post-crisis period. It is also hard to control for the effects of other developments in the economy, including the effects of monetary and fiscal tools that are often used in conjunction with MPIs. And, of course, good (or bad) macroprudential policy is no substitute for an effective design of the normal (micro)prudential framework. Dynamic provisioning in Spain, for instance, has (until recently) been praised for strengthening Spanish banks' risk management and loan-loss buffers before the crisis; however, it had only a small effect on property prices, credit growth and lending standards (Borio and Shim, 2007). Moreover, the Spanish banks' loan-loss buffers were, in the end, far too small to handle the eventual downturn in the property market, and the losses were in any case much higher for property development loans than on loans to households.

Timing and negative externalities

Ideally, MPIs should be well timed: deployed before systemic risks become too great and then withdrawn when they subside. Macroprudential tools are designed to be time-variant to an extent, so we should expect to see some tightening and loosening of tools as we move through the business cycle. That said, quick, successive tightening of the kind seen recently in Canada, Hong Kong, Israel and Singapore likely indicates both uncertainties around effectiveness and/or a failure in timing. Those countries are now into their fourth or fifth rounds of tightening – several years after first identifying risks that warranted a macroprudential response. None appear close to the point where they can think about moving to the loosening phase. Given their relative inexperience, it appears that advanced economies have thought it wise to start small and risk having to recalibrate their tools later, rather than start big and trigger a sudden market correction.

Getting the timing and coordination of policies right is also important, in part because of their signalling effect.

Leakage, arbitrage and other negative externalities limit an MPI's overall effectiveness, too. Often, the available data does not give a clear indication of whether policymakers are successfully clamping down on dangerous behaviours, or merely symptoms. Dampening asset price growth does not directly affect social welfare, and the relationship between asset prices and financial stability might not be stable; it might be that housing market outcomes are just a proxy for the real risks in property development and commercial real estate lending. Identifying those behaviours in the first place can be difficult, and there is always the potential for imbalances to migrate to other parts of the financial system.

Elliott James
Financial Stability Department
27 May 2013

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Appendix

Table A1: The Use of Macroprudential Tools*

	Date	LVR caps	DSR caps	FX lending / mismatch	Lending ceiling	Risk weights	Maturity mismatch / liquidity	Required reserves	Provisions	Limits on capital distributions	Capital adequacy requirements
Americas											
Argentina	2010									✓	
Brazil	2005-2007 2008-2010			✓				 ✓	✓		 ✓
Canada	2008-2011	✓									
Chile	2008-2009	✓						✓			
Colombia	Late 1990s 2007-2009	✓	✓	✓			 ✓	 ✓	 ✓	 ✓	
Mexico	End 1990s 2010			✓					 ✓		
Peru	2001-2010			✓				✓	✓		
Uruguay	1990s 2001 2005			✓		 ✓	✓		 ✓		
Asia-Pacific											
China	2010-2011	✓			✓			✓	✓		
Hong Kong	1990s 2009-2010	✓ ✓	 ✓		✓ ✓						
India	2004-2010	✓				✓		✓	✓		
Indonesia	2010-2011							✓			
South Korea	2002-2011 2009-2011	✓	✓	 ✓			✓	✓			
Malaysia	1990s 2005 2010	✓ ✓			✓	 ✓		✓			
Mongolia	2010-2011			✓			✓	✓	✓		
New Zealand	2010-2011						✓				
Singapore	2009-2011	✓			✓		✓				
Thailand	2002-2011	✓	✓	✓		✓					
Europe											

Austria	2003-2010			✓							
Bulgaria	2004-2007 2008-2010	✓				 ✓		✓ ✓	✓		✓
Croatia	2003-2008	✓	✓		✓		✓	✓	✓		
France	2010						✓				
Greece	1999-2005		✓		✓				✓		
Hungary	2010	✓	✓	✓							
Ireland	2006					✓					
Italy	2007	✓									
Norway	1998 2010	 ✓	 ✓			✓					
Poland	2006-2011		✓	✓		✓		✓		✓	
Portugal	1999								✓		✓
Romania	2000s	✓	✓	✓				✓	✓		
Russia	2008-2010		✓	✓				✓	✓		
Serbia	2004-2011		✓	✓			✓	✓		✓	✓
Slovakia	2008-2009						✓			✓	
Spain	2000-2008					✓			✓		
Sweden	2010	✓									
Switzerland	2008 2013										✓ ✓
Turkey	2008-2009 2009-2010	 ✓		✓						✓	
Middle East and Africa											
Lebanon	1997-2009 2008-2009	 ✓		✓				 ✓			
Nigeria	2008-2010			✓	✓		✓	✓			
South Africa	2008										✓
	Date	**LVR caps**	**DSR caps**	**FX lending / mismatch**	**Lending ceiling**	**Risk weights**	**Maturity mismatch / liquidity**	**Required reserves**	**Provisions**	**Limits on capital distributions**	**Capital adequacy requirements**

* Does not include macroprudential measures announced after 2011; LVR = loan-to-valuation ratio; DSR = debt-servicing ratio
Source: Lim et al. (2011)

Table A2: Macroprudential Tools Across Time

Table 2: Prudential measures and monetary controls*												
	Prudential instruments						FX policy measures[1]	Monetary instruments				
	LTV	Capital + LTV[2]	Capital	Provisions	Exposure limit	Lending criteria		Credit limit	Credit limit + marg RR	Average RR	Marginal RR	Liquidity
Euro area												
Finland									89-90	88,89		
Greece				05		05			99-00			
Ireland		06										
Portugal		99		99								
Spain				00[3]								
Other Europe												
Bulgaria	04	04	04, 05	04, 05					05	04		
Croatia	06			03, 06		06	03, 05, 04, 05, 06		03-03[4], 07		04, 05, 06	03, 05
Estonia			06							06		
Iceland												99
Latvia										04, 05, 06		
Norway		98-01										
Romania	04			02, 05	04, 05	04, 05	04, 05, 06			04, 05, 06		
Asia												
China	01,05,06					04				03, 04, 06, 07		
Hong Kong	91,97				94-98			94				
India			05, 07	05, 06, 07						04, 06, 07		
Korea	03, 06					06	06			06		
Malaysia	95-98		05		97-98	95				94-98		
Thailand	03					04, 05						

* LTV: loan-to-value ratio, Capital: capital requirements, Provisions: loan provisioning rules, RR: reserve requirements, Credit Limit: Limit on credit growth, Liquidity: liquidity requirement, Lending criteria: Limits on debt-repayment-to-income ratio or debt-repayment-to-debt ratio or credit-line-to-income ratio, Exposure Limit: credit exposure to a sector. The years indicated refer to the timing of the introduction of the measure. A year coming after a hyphen refers to the timing of the lifting of the measure.

[1] Specific controls other than general restrictions on net FX positions aimed at limiting credit expansion. [2] Capital requirement weights linked to loan-to-value ratios.

[3] Statistical provisioning. [4] Introduced in January 2003 and discontinued in December 2003. Requirement to purchase central bank bills at a penalty rate instead of maintaining reserves.

Source: Borio and Shim (2007) 'What Can (Macro-)prudential Policy do to Support Monetary Policy', BIS Working Papers No 242

Table A3: Recent Use of Macroprudential Tools

	Canada	Sweden	Norway	Switzerland	Hong Kong	Singapore	New Zealand	Israel	South Korea	Turkey
Loan-to-valuation ratio (LVR) caps	Reduced from 100% to 95% for new home loans; 80% for refinancing and investment properties	Cap on mortgages with an LVR above 85%	Cap on mortgages with an LVR above 85%		Lower maximum LVRs for borrowers with multiple properties and C&I loans	LVR limited to 60% for mortgages with amortisation above 30 years		LVRs capped at 75% for first-home buyers, 70% for repeat buyers; 50% for investors	LVR cap in Seoul reduced from 60% to 50%	LVR caps on housing loans (75%) and commercial real estate loans (50%)
Risk weights		Minimum IRB risk weight of 15% for residential mortgages	Proposed capital add-on for residential mortgages	Higher risk weights for high-LVR mortgages	Minimum IRB risk weight of 15% for residential mortgages		Higher IRB risk weights for current and new high-LVR loans	As LVR rises above 45%, risk weight rises from 35% to 75%		Higher risk weights for consumer loans (‘general purpose loans’)
Underwriting standards	Yes		Yes							
Debt-servicing ratio (DSR) caps	Gross DSR capped at 44%; total DSR capped at 39%				Maximum DSR lowered to 40% for borrowers with multiple properties				40% DSR limit for certain loans, expanded throughout metropolitan Seoul	
Amortisation periods	Maximum period reduced from 30 to 25 years			At least one-third paid down within 20 years	Maximum period set at 30 years	Maximum period set at 35 years				
Other	Tightened criteria for government-guaranteed mortgage insurance			Counter-cyclical capital buffer (1% CET1 for home loans)	Lifted repayment buffers by 100 bps; additional stamp duty	Minimum cash requirement; consumer education; higher stamp duty		Provisioning for floating rate and/or high-LVR loans	Leverage cap on FX derivative positions; levy on non-deposit FX liabilities	Provisioning for consumer loans; credit card payment limits; interest rate risk exposure

Sources: national authorities

Low interest rates and alternative policies: some considerations

This note sets out some considerations for managing risk and some policy tools that might or might not be considered to support financial stability . Other than avoiding an over-easing of monetary policy, the most promising policy response seems to be to introduce a regulatory regime that automatically requires larger interest buffers in loan affordability calculations when interest rates are low. This could be introduced either as a prudential measure or as part of the National Consumer Credit Code, or both.

II. Designing the prudential and other policy frameworks

If a potentially harmful credit boom did occur, it should not necessarily be concluded that a consciously countercyclical tool is the appropriate policy response. A flaw in the design of the overall prudential policy framework could also have raised the financial system's propensity to create asset booms in a given environment. The outcomes of both problems are observationally equivalent: a credit boom. If the issue is a design flaw, the appropriate response is a one-off fix, not a countercyclical tightening or easing of some parameter in the prudential framework.

Among the parameters of the prudential framework that might need to be tightened, relative to a plain-vanilla Basel II implementation, are the minimum risk weight that can apply to mortgage lending generally as well as to mortgages that are non-standard or otherwise higher risk. APRA had already done this in the Australian context by requiring more capital to be held by standardised ADIs for high-LVR uninsured, low-doc and other non-standard loans, and by enforcing a higher loss-given-default floor for mortgage lending for the advanced banks. It might be worth revisiting this issue and assessing whether a further tightening is required, for example, on interest-only loans or loans involving high debt-servicing ratios; high-LVR lending has not become more common recently and low-doc lending as all but disappeared, so these dimensions of lending standards are unlikely to pose a near-term issue.

A more conservative prudential stance has not prevented countries in Asia, as well as possibly Canada, from experiencing property booms and, in some cases, an alarming easing in lending standards. However, in each case the conservative regulatory stance has been offset by other policy choices. Most of the countries in Asia facing issues in their property markets either have been intervening in their FX markets or have explicitly managed exchange rate regimes. They therefore probably have lower interest rates than a medium-term inflation-targeting framework would produce. Canada, meanwhile, faces a particular issue in that the public sector bears the credit risk in the mortgage market via the public mortgage insurer. As a result, Canadian banks are able to generate more credit risk in the mortgage market than if they had to hold their own capital against the whole exposure. This is not to say that some countercyclical tightening of prudential policy settings is never warranted. But if monetary policy responds appropriately to exchange rate appreciation, *and* the prudential framework is sufficiently tight and has no leakages through public sector involvement in absorbing credit risk, the set of circumstances in which a countercyclical response to a credit boom is needed is much narrower.

The prudential framework is not the only aspect of public policy that needs to be calibrated appropriately to reduce the risk of harmful property-related credit booms. As the Bank previously pointed out, tax systems can shape the incentives to engage in leveraged property speculation.[1] On several occasions in Australia, property booms have been associated with periods where equity prices have recently declined considerably and therefore look volatile and unattractive to retail investors. Those investors were no doubt also influenced by the relatively generous tax treatment of property-related investment expenses; the design of capital gains tax is also relevant. For all their other inefficiencies, high stamp duty rates do put some restraint on the scope for speculation by 'flipping' properties. It is therefore not surprising that they have been used as a macroprudential tool in countries such as Singapore.

The regulatory regime for consumer credit protection can also help lean against housing booms and related easings in lending standards. For example, the Australian code requires lenders to check that mortgage borrowers can repay the loan from their own resources without having to sell the property to do so. This deters purely asset-based lending, which is inherently speculative. It also prevents loan amounts being granted that are truly unaffordable to the borrower, including via excessively long loan terms.[2]

III. Possible policy tools

If the overall policy framework is considered sufficiently prudent and is not inadvertently encouraging asset/credit booms, then a temporary response to avert an asset boom could be considered. It would therefore be useful to have some criteria for selecting an appropriate policy response. In particular, any policy measure should:

a) Address the actual risk to financial stability and be proportionate to those risks;

[1] RBA (2003), *Submission to the Productivity Commission Inquiry on First Home Ownership*, Occasional Paper No 16.
[2] In contrast, prior to the MAS's October 2012 macroprudential package, which capped loan terms at 35 years, 50-year mortgages were common

b) Influence behaviour rapidly enough that growing risks can be mitigated, taking policy implementation lags into account;

c) Minimise any unintended consequences, including distributional impacts; and

d) Avoid subversion of its intent through regulatory arbitrage.

This section considers some possible 'tools' that might lean against property booms during periods of unusually low interest rates. It does not explicitly consider a purely supervisory response, such as engaging with boards on the need to allow for the temporary nature of such low levels of interest rates. Neither does it present a comprehensive listing of jurisdictions using or contemplating these tools. In considering each policy, criterion (a) above implies that policies should be directed against the aspect of lending standards that have eased the most, or that pose the most risk to future financial stability. Such an approach recognises the multi-dimensional nature of lending standards, as acknowledged in the FSB Principles for Sound Residential Mortgage Underwriting Practices. On the other hand, if regulatory limits are imposed on mortgage lending standards, but not on loans to property developers, they may not be targeted at the most pressing risks to the banking system.

A. LVR cap or limit

Caps on mortgage loan-to-valuation ratios (LVRs) are the most frequently proposed, and most-studied, macroprudential tool. A limit on high-LVR mortgage lending has been frequently used in Asia and elsewhere. The RBNZ has announced that one of its possible macroprudential responses will be a 'speed limit' that limits the fraction of new loans that can be written at high LVRs, rather than banning such loans outright. The limited empirical evidence so far suggests that this measure can help dampen a boom temporarily, but there has not been a case of LVR caps being sufficient to offset the effects of low or falling interest rates beyond the short term. On the other hand, there is some evidence from Hong Kong to suggest that when LVR caps are imposed in a boom, banks' loss rates are lower when the bust finally comes. This is because borrowers then have more equity to absorb the falls in property prices before they fall into negative equity and face potential default. (It is worth noting that requiring loans to amortise has a similar effect, and that increased use of interest-only loans might therefore be a source of concern.)

Granting that this tool can have the desired effect of limiting risk, the question is how well it meets the criteria above. In general, a hard cap might not be well targeted at the true source of risk. It is quite possible to originate a prudent loan that has a high LVR (albeit below 100 per cent), and the kinds of borrowers who take out such loans (primarily first-home buyers) are not necessarily the main source of either the risks to financial stability or the speculative pressure on housing prices. The negative distributional effects on first-home buyers have deterred the authorities in the United Kingdom and elsewhere from introducing this tool. This issue is particularly relevant in the Australian environment, where much of the boost to borrowing could come from buy-to-let investors, who generally have lower LVRs at origination than owner-occupiers. Setting a blanket cap could in fact have the perverse effect of publicly validating LVRs below the limit as being acceptable for all borrowers, when in fact there might be some classes of borrower that should be subject to stricter limits as part of normal credit risk management. A cap on LVRs would be particularly difficult to enforce on property developer loans, where the uncertainty around the value of the finished project can render an LVR at origination meaningless. A NZ-style speed limit mitigates these concerns somewhat, but there is little empirical evidence or theoretical basis to say what the right fraction of high-LVR lending might be, other than that it is not zero.

B. Serviceability limits and other caps

Another commonly discussed quantitative limit on mortgage lending practices relates to the serviceability dimension of lending standards. Several countries have set limits on debt servicing or repayments to borrower income (debt-servicing ratio, or DSR), while the Turner Review advocated limits on loan *size* to income multiples (LTI).

Focusing on serviceability rather than collateralisation, as with an LVR cap, is probably a better approach to assessing the risk of future loan losses and thus financial instability. However, a DSR limit still suffers from many of the same issues as LVR caps. It is not necessarily targeted at the most risky lending, and a blanket limit might be too restrictive for some borrowers, while perversely validating a ratio that is too high for some other borrowers. Traditionally, a ratio of housing costs to income of 30 per cent or more was considered to indicate housing stress, but recent research shows that many higher-income households can manage much higher ratios without falling into stress.[4] As noted by Ellis (2013), best-practice credit risk management goes beyond simple numerical limits on particular dimensions of lending standards.[5]

The loan-to-income multiple is a particularly problematic measure, in that it presupposes that the appropriate LTI is constant through time and across regions. Clearly the equilibrium LTI would have increased following a permanent disinflation, as Australia experienced in the 1990s. Historical experience would therefore not be a guide to a permanent limit, though it might be reasonable to expect it not to rise further from here. More generally, the mechanics of economic geography would suggest that housing prices should be higher in larger cities, even relative the higher incomes earned in larger cities, and thus so should LTIs.[6] A national LTI limit would distort this outcome, but a regionally differentiated limit would be difficult to calibrate and politically difficult to implement.

C. Interest buffer guidelines

It is common practice in Australia, though less so overseas, for lenders to calculate allowable loan amounts using higher interest rates than those currently prevailing. Good practice would suggest that the difference between actual and qualifying interest rates should increase when actual interest rates are unusually low. Liaison suggests that many, if not all, lenders do this, but there is a case for doing more to ensure that interest rate buffers are countercyclical to actual interest rates.

This measure seems to lack some of the disadvantages of some other tools discussed in this note. The countercyclical variation with interest rates directly targets the source of risk to the financial system – the boost to demand for property and credit resulting from the low level of interest rates – while still ensuring that existing borrowers' cash flows benefit from those lower interest rates. By influencing the *inputs* into the affordability calculation rather than determining that calculation, this measure also avoids distorting distributional aspects of prudent lending practices or setting a benchmark for lending standards that might be inappropriate for some borrowers. If built into the consumer protection framework instead of or in addition to the prudential framework, it would be robust to regulatory arbitrage.

There are several ways to encourage larger interest buffers. Supervisory engagement is probably the most nimble of these. It would also be possible to build a requirement to increase the interest buffer when interest rates are low into prudential practice guides, formal prudential rules and/or guidance around the consumer credit code. Although introducing such guidance would be subject to normal consultation processes and other implementation lags, it could then be a permanent feature of the regulatory landscape that would serve as an automatic stabiliser without implementation lags.

D. Countercyclical capital buffer

The countercyclical capital buffer is a consciously macroprudential element built into the Basel III framework. The idea is that, if banks are forced to build up extra capital in the late stages of a boom, they will be more able to absorb losses in the subsequent downturn. Although the BCBS documents footnote the idea that this buffer could help lean against a credit cycle or asset price boom, this possibility is

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[4] See, for example, Rowley, S and R Ong (2012), 'Housing affordability, housing stress and household wellbeing in Australia', AHURI Final Report No.192. Melbourne: Australian Housing and Urban Research Institute. The authors describe the 30 per cent DSR metric as 'problematic'.

[5] Ellis L (2013) 'Macroprudential policy: what have we learned?', paper presented to the Bank of England Centre for Central Banking Studies Workshop for Heads of Financial Stability, March 2013,

[6] See Andrews D (2001), 'City Sizes, House Prices and Wealth', Reserve Bank *Bulletin*, December 2001, pp 1–6 and Kohler M and K Smith (2005), 'Housing and the Household Wealth Portfolio: The Role of Location', RBA Research Discussion Paper 2005-10.

downplayed. The BCBS concluded that this tool might not be effective at dampening booms, for a number of reasons.

- The amounts of capital involved are unlikely to raise borrowing costs enough to make much difference in a speculative boom.
- The lags involved in this tool are too long to respond to the boom effectively. The Basel rules require at least a year between the announcement of an adjustment to the buffer and it coming into effect. In addition, the suggested guide for deciding to deploy the buffer (a de-trended credit-to-GDP ratio) is by design quite slow-moving and only signals a need to act after credit growth has been above trend for some time.
- Mortgage lending is interest-sensitive but not very capital-intensive (i.e. it quite properly attracts lower risk weights than corporate lending), while lending to trade-exposed businesses is less interest-sensitive and quite capital-intensive. The combination of high overall capital requirements and low interest rates would therefore have the opposite of the desired distributional effect of dampening the property sector and boosting the trade-exposed sectors.

Another consideration is that, unlike the LVR and DSR limits discussed above, the countercyclical capital buffer cannot be enshrined in consumer protection regulation and instead can only be imposed on prudentially supervised firms. It is therefore inherently more prone to leakage through regulatory arbitrage to the non-supervised sector than these other tools.

E. Periodic sectoral risk-weight or capital add-ons

A sectoral risk-weight or capital add-on is one of the tools made available to the Financial Policy Committee as part of the recent reforms in the United Kingdom. Imposing higher capital on particular portfolios rather than on whole institutions has the advantage of being more targeted than countercyclical capital buffer. However, it is subject to the some of the same disadvantages, including the small effect on borrowing costs, the slow speed of implementation and the risk of leakage outside the prudentially regulated sector. In addition, increasing risk weights on residential mortgage lending might have the perverse effect of encouraging banks to deploy their capital to business lines that are actually riskier, which need not be the trade-exposed business lending that policy might be seeking to encourage.

F. Dynamic provisioning

Dynamic provisioning is mainly associated with the Banco de España. In principle, higher provisioning expenses generate stronger incentives against over-exuberant lending than does higher capital, because they reduce profits (and thus management bonuses) directly during the upswing. There is evidence that having extra provisions did some good in protecting the Spanish banking system from losses in the downturn, though clearly they were not sufficient to prevent the boom-bust cycle from occurring. APRA could (and does) use its supervisory powers to encourage higher provisions against property-related exposures. However, a full-fledged Spanish-style regime requires the supervisor to have access to comprehensive loan-level data (a credit register) over at least one full business cycle, in order to estimate the required provisioning. Even if APRA developed a true credit register, it would not have loss information for a period of serious economic downturn, at least until the next one occurred. This is a consequence of Australia's long economic expansion, and it is unlikely that the loss experience in other countries would be comparable enough to be used in Australia.

G. Taxation measures

As noted above, incentives generated by the tax system can shape households' predisposition lever up into property, particularly investor property. A holistic view of policies to manage property booms should therefore probably include consideration of whether the tax system should be modified to reduce some of these incentives. Stamp duties have been used both in Australia and abroad as a tool to slow or to boost the housing market, sometimes for explicitly macroprudential reasons. Other elements of the tax system that could be considered include the deductibility of non-cash expenses such as depreciation, and the

calculation of capital gain for tax purposes. Changes to tax regimes have the advantage that they can be targeted reasonably precisely at speculative behaviour and risk. However, any taxation changes should be considered a one-off fix rather than a countercyclical tool, given the implementation lags involved. As the experience of vendor duty in NSW in 2004–05 showed, such changes are unlikely to be politically feasible at the exact time they are needed, in a property boom.

H. The complications of supply

During many housing booms, it is common to hear claims that supply constraints are causing prices to rise, rather than the increase being demand-driven. While some supply constraints are inherently geographical (e.g. coastlines and mountains), most housing systems contain features that slow supply down more than strictly necessary. These frictions include slow approval processes, shortages of qualified trades and tax and other costs. Given that Australia (and New Zealand) consumes more urban land per capita than any other sizeable country, it is not entirely clear that land supply constraints or density requirements have been the key issue here.[8] Even assuming that the supply constraints are material, though, fixing the problems that result in supply constraints should probably not be attempted in the middle of a property boom. If successful, the ensuing upsurge in supply could result in a supply overhang once the boom ultimately ended.[9] In addition, excessive focus on supply constraints when demand is booming might distract policymakers from addressing the sources of that boom in demand.

IV. Tentative conclusion

The discussion above suggests that many of the suggested policy tools for dealing with property booms carry problems of their own. Certainly intense supervision around property-related lending should be involved, and some tightening of prudential guidance around property-related lending could be considered. Further tightening of consumer protection regulation could also be considered. Within the dimensions of lending standards, more focus should probably be given to serviceability and amortisation than LVR or low-doc lending. Building in an automatic stabiliser to offset some of the effect of interest rate movements on allowable loan sizes seems to be relatively well targeted, while involving the fewest drawbacks.

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[8] See Graph 7 in Ellis L (2013), 'Housing and Mortgage Markets: The Long Run, the Short Run and the Uncertainty in Between', Address to the Citibank Property Conference, Sydney, 23 April 2013.
[9] See Ellis, L, M Kulish and S Wallace (2012), 'Property Market Cycles as Paths to Financial Distress', in Heath A, Packer F and Windsor C (eds), *Property Markets and Financial Stability*, Reserve Bank of Australia.